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COLLEGE OF AGRICULTURAL SCIENCES  
MAYAGUEZ CAMPUS



ANNUAL REPORT OF A GRANT TO  
STRENGTHEN THE COMPETENCE OF THE

UNIVERSITY OF PUERTO RICO

IN DISEASE CONTROL AND RELATED INSECTS  
AND CULTURAL PRACTICES OF SOYBEANS  
AND OTHER FOOD LEGUMES FOR  
TROPICAL AND SUBTROPICAL  
AREAS



AGRONOMY  
DEPARTMENT

211(d) Annual Report of the University  
of Puerto Rico

Date due: December 15, 1974

Date: December 11, 1974

Grant Title: A Grant to Strengthen the Competence of the University of Puerto Rico in Disease Control and Related Insects and Cultural Practices of Soybeans and Other Food Legumes for Tropical and Subtropical Areas.

Grantee: University of Puerto Rico, Mayaguez Campus

Grant Program Director: Dr. Raúl Abrams

AID Sponsoring Technical Office: Bureau of Technical Assistance,  
Office at Agriculture

Statistical Summary:

Period of Grant: October 1, 1973 to October 1, 1978 Amount of Grant  
\$500,000.00 Expenditures for Report Year \$68,450.03 Accumulated:  
\$68,450.03 Anticipated for next year \$116,474.32

B. Narrative Summary

The first year major efforts have been directed toward achieving the objectives of the University of Puerto Rico 211(d) Grant Program: (1) to improve and increase the capabilities of the University of Puerto Rico to provide needed research, training and informational linkages, technical assistance and consultations on major problems of disease control and related insects and (2) the development of improved cultural practices of soybeans and related legumes for tropical and subtropical areas.

To implement these objectives the following provisions have been taken:

1. Appoint a senior faculty member as Grant Director to coordinate our efforts with those of the University of Illinois, and to provide policy and program guidance.
2. Appoint a senior staff member so as to develop specializations and increased competence within the staff on the area of weed control of the edible legumes.
3. Appoint a senior staff member "half-time in the area of plant pathology to provide expertise and knowledge in soybean diseases. The edible legumes research contract for Improvement of Tropical Productions of Beans and Cowpeas Through Disease and Insect Control, finances the other half time of the senior staff member, which is complementary to the overall edible legume disease expertise.
4. Provide a junior staff member "half time" to assist the senior Plant Pathologist.
5. Provide a field and laboratory technician for an effective development of the research program .
6. Provide financial support to graduate students contributing to the program.
7. Develop new courses and an option in the area of Crop Protection.
8. Strengthen library and other informational services and provide for the preparation of training aids pertinent to the project.

The University of Puerto Rico has made available our physical resources as well as our existing staff competences and maintains excellent working relationships with the University of Illinois.

## C. Detailed Report

### 1. General Background and Description of Problem

In the past two years hunger and famine has ravaged hundreds of millions of the poorest citizens in at least 40 nations. The world food picture does not present a pleasant prospect for many regions, especially the over-populated areas in the tropical regions of the world, despite great advances like in cereal crop production. The world reserves of grain have reached a 22-year low. The main cause of the increase in food demand is of course, the population explosion which is far greater in the tropics than elsewhere in the world. A major lag in research and production exists in the tropics for the more extensively grown legume crops, many of which are excellent sources of cheap high quality vegetable protein.

Soybeans is one of the world's principal legume crops. It may become increasingly important in the tropical and subtropical parts of the world where there is great need for the improvement of the human diet. Recent research in Puerto Rico by ARS and the University of Illinois, indicates that soybean production is feasible in the tropical world. However, further information is needed in order to obtain higher yields through the full use of year-round growing weather, combined with high yielding adapted cultivars and intensive cultural and management practices.

To this end, AID awarded a five-year grant to the University of Puerto Rico in order to strengthen the existing competence to provide needed training, research and informational linkages, technical assistance and consultation on major problems related to limiting diseases and associated insects and cultural practices of soybeans and other food legumes for the tropical and subtropical areas. The developed competencies will be used to increase significantly soybean production and utilization to improve the human diet of the low income areas of the world.

It will be a collaborative effort with the University of Illinois and will provide the University of Puerto Rico with two senior and one junior staff members, short term visiting lecturers, technicians and with financial support for three graduate students. It will also provide for staff and student travelling, strengthen library and increase Puerto Rico's capacity to do research in control of soybean and other food legume diseases and insects and cultural practices.

In coordination with the University of Illinois, it will provide facilities to graduate students from Illinois to do their research work in the tropics and for graduate students from Puerto Rico to pursue advanced studies toward a Ph. D. at Illinois.

## 2. Purpose of the Grant

The purpose of this grant is to faster the development of University of Puerto Rico's competence and response capability in disease control and related insects and cultural practices of soybean and other food legumes for tropical and subtropical areas of the world. A cooperative program with the University of Illinois will be developed to create a joint

competence in tropical soybean research, training, linkages with international and national centers and direct assistance.

### 3. Objectives of the Grant

#### A. Objectives Restated

This grant will increase and improve the capabilities of the University of Puerto Rico to provide needed research, training and informational linkages, technical assistance and consultation on major problems of disease control and related insects and cultural practices of soybeans and related legumes for tropical and subtropical areas in a collaborative effort with the University of Illinois. To fulfill the objectives, the grant provides for:

- 1) Appoint a project leader who would coordinate Puerto Rico's efforts with those of Illinois.
- 2) Appoint two senior and a junior staff members in the area of plant pathology and weed control to establish strong programs of teaching, research, training and informational linkages, with special emphasis on disease and associated insects as well as improved cultural practices for specific environments for soybeans.
- 3) Provide support for graduate students contributing to this project, including exchange students from Illinois.
- 4) Appoint one field and one laboratory technician for a more effective research program.
- 5) Provide for visiting professorships to be used to bring to the University of Puerto Rico additional expertise and experience to the project.
- 6) Make available physical resources, including office space, laboratories, equipment and other facilities and services, as well as existing staff competencies as the institution's contributions.

- 7) Develop a viable educational and research project on soybean and other edible legumes for the tropics with emphasis on crop protection and production-management practices and accomodate requests for training, technical assistance and consulting services as feasible and consistent with institutional resources and commitments.

#### B. Review of Objectives

The major objectives of this grant are to create comprehensive knowledge, experience and expertise on major problems of disease control and related insects and cultural practices of soybeans and related legumes for tropical and subtropical areas at the University of Puerto Rico. This objectives are to be achieved via (1) assesing the currently existing knowledge, (2) increasing researchers competence, (3) developing an information system, and (4) increasing the capacity to conduct research as related to the subject matter of the grant.

Grant activities have, in general, been consistent with the original objectives.

#### V. Accomplishments

The proposed program will strengthen the existing competence of the University of Puerto Rico to increase significantly soybean production and utilization to improve the human diet of the low income areas of the world, specially the tropical and subtropical areas.

A. Improvement of educational capabilities at University of Puerto Rico for students and staff to acquire greater knowledge on the major problems related to limiting diseases and associated insects and cultural practices of soybeans and other food legumes of the tropical and subtropical areas of the world.

1. Educational capability on limiting diseases and associated insects and cultural practices of soybeans and other food legumes on the UPR Campus will be strengthened in the following areas:

a) Undergraduate and Graduate studies. An educational team formed from members of the Agronomy Department, Plant Pathology Department and new staff members supported by the grant, revised and prepared a new option in the area of Crop Protection geared toward disease, insect, nematode and weed control of tropical crops with emphasis on soybean and other legumes. This option in Crop Protection will comprise a total of 12 courses at the undergraduate level and 11 at the graduate level. The following new courses were presented during the academic year.

- (1) Plant Science 401 - Tropical Phytopathology. Three credit hours. Two one-hour lectures and one three-hour laboratory per week.
- (2) Plant Science 443 - Introduction to Agronematology. Three credit hours. Two one-hour lecture and one three-hour laboratory per week.
- (3) Plant Science 581 - Nematode Diseases of Plants. Three credit hours. Two one-hour lecture and one three-hour laboratory per week.
- (4) Plant Science 608 - Advanced Tropical Phytopathology. Four credit hours. Three one-hour lecture and one three-hour laboratory per week.

b) Teaching: Since the initiation of the program, Dr. Raúl Abrams, Chairman of the Agronomy Department, has been in charge of all 211(d) activities.

As of July 1, 1973 Dr. Pedro Meléndez has been incorporated into our staff as Associate Plant Pathologist on a 50 percent basis of his time

and salary from the grant. Dr. Meléndez has participated in the revision and preparation of the new option in Crop Protection and will be teaching graduate course. Methods of Research in Plant Pathology; the course Advanced Tropical Phytopathology and will also conduct research in the area of edible legumes phytopathology.

As of July 1, 1974 Dr. Victorio García has been appointed Assistant Professor in Plant Pathology on a 50 percent basis of his time and salary from the grant. Dr. García will be teaching the undergraduate course Tropical Phytopathology, and conducting research in the area of soybean phytopathology.

As of November 1973, Mr. Rafael Rufz and Mr. Eduardo Riera were appointed laboratory and field technicians, respectively, in order to develop a more effective research program for the grant.

c) A Workshop on Soybeans for Tropical and Subtropical Conditions was held at the University of Puerto Rico, Mayaguez Campus, February 4-6, 1974, in cooperation with the University of Illinois with the following participants:

Dr. A. Morales Carrión President U. P. R.	Welcome and Opening Remarks
Professor S. Alemany Dean Agriculture UPR	The Task Ahead
Dr. G. K. Brineragor Director International Program US	Talk is not Just Talk
Dr. C. N. Hittle University of Illinois	The International Soybean Program
Dr. R. Abrams University P. R.	University of P. R. Soybean Program

Dr. K. Whigham University of Illinois	International Variety Trials
Dr. J. Hammerton University of West Indies, Trinidad	Weeds And Weed Control
Dr. J. Bird University of P. R.	Virus Diseases
Dr. J. B. Sinclair University of Illinois	Bacterial and Fungal Diseases
Dr. J.W. Epps University of Tennessee	Nematodes of Soybeans
Dr. M. Koogan University of Illinois	Insect Pests
Dr. G.L. Godfrey University of Illinois	Synoptic Collection of Insects
Dr. K. Hinson USDA-University Florida	Tropical Production of Soybeans
Dr. L.H. Camacho ICA - Colombia	Breeding Soybeans for Tropical Conditions
Dr. C.A. Brim U. S. D. A. North Carolina State Univ.	Off-Season Soybean Nurseries
Dr. F.K. Koo University of P. R.	Special Breeding and Evaluation Techniques
Miss J. Dobereiner IPEACS - Brazil	Rhizobium and Symbiotic Nitrogen Fixation
Mr. J. Vicente Chandler U. S. D. A. University P. R.	Fertilizer, Population, Soils, Planting Dates
Mr. F. Gómez Moncayo ICA - Colombia	Soybean Seed Production in Colombia
Dr. R. Bressani INCAP - Guatemala	Soybean in Human Nutrition
Drs. A. I. Nelson and L. K. Ferrier University Illinois	Soybean Processing and Demonstration of Soybean Foods

The workshop was attended by a total of 71 scientists representing 13 different countries with major interest in tropical production of soybeans.

d) Visiting scientists and Seminars: Dr. Guillermo Riveros, Plant Physiologist, ICA, Ministry of Agriculture, Colombia, spent four days on campus lecturing and presented a seminar on Weed Control Experiments with Soybeans in Colombia. A good possibility exists that Dr. Riveros will accept a position in our Department as Associate Professor in the area of Weed Control, to be funded by the program.

e) Equipment has been bought for the preparation of audio-visual and auto-tutorial teaching aids. Audio-visual techniques will be introduced in as many courses as possible.

As a result of our 211(d) activities, and program, the undergraduate students have shown great interest in our Crop Protection option with emphasis on legume crops. The number of graduate students in this same area has increased to nine during FY 74-75.

Research: Research of five graduate students was totally or partially funded under 211(d) grant.

a) Thesis research

1. Miss Ivonne Shattuck is a native of Puerto Rico majoring in Crop Protection. The objective of her research is to study the host-parasite relations of *Cercospora Kikuchii* (Matsumoto & Tomoyaso) Chupp on soybeans. Miss Shattuck holds a Graduate Assistantship funded by 211(d).

2. Mr. Federico Cuebas is a native of the Dominican Republic. The objective of his research is a study on the mutagenic specificity of 5-bromodeoxyuridine in relation to soaking time of soybean seeds. Mr. Cuebas holds a Graduate Assistanship funded by 211(d).

3. Mr. Ernesto Leypón is a native of Nicaragua, Central America. The objective of his research is studies and chemical control of bacterial pustule caused by *Xanthosomas phaseoli* var. *sojensis*. Mr. Leypón holds a Graduate Assistanship funded by 211(d).

4. Mr. José M. Arrieta is a native from Colombia, South America and even though he receives University funds for his Graduate Assistanship, he is doing research to study the pathogenicity and control of phytoparasitic nematodes of soybeans in the tropics. This is a clear indication of the interest and impact generated among the graduate students by this grant program.

5. Mr. José A. González is a native of Nicaragua, Central America. The objective of his research is studies in the epidemiology and control of purple seed stain caused by *Cercospora Kikichli*. This is another research study generated by the soybean grant among graduate students.

b) In order to improve and develop a more effective research program a field and a laboratory technician were appointed and their salaries paid by the grant. These technicians will assist in laboratory

and field plot work, data recording and filing, and the preparation of reports on grant projects.

Besides the graduate students research projects that Drs. Meléndez and García supervise, they are engaged in the preparation of new projects in plant pathology studies on soybeans. A more detailed report will be available for next year.

c) Although the University of Puerto Rico does not have a research contract for soybeans, staff members are actively engaged in research funded by AID for the Soybean Resource Base. Most of the research conducted is in the area of cultural practices like variety trials, variety date of planting-plant population studies, and fertilizer and inoculation trials.

d) Educational travel: Domestic travel of grant officers to comply with administrative and executive duties related to the grant are not included in this item. The following is a chronological account of domestic and international trips of educational nature made by staff members during the report period and supported with grant funds.

In November, 1973, Dr. J. R. Mondoñedo traveled to Las Vegas, Nevada to attend the Annual Meeting of the American Society of Agronomy and to participate on the deliberations of the International Committee of the Society.

In December, 1973, Dr. Raúl Abrams traveled to Washington, D. C. to participate in a Program Design and Management Seminar offered by

AID. The objective of this seminar was to acquaint participants with key elements of project design, the methodology of the logical framework, and the process of project evaluation. Dr. Abrams was invited by AID to attend this workshop.

In March, 1974, Drs. P. Meléndez, F. Jordán, R. Abrams and F. Juliá traveled to Panamá City, Panamá, to attend and participate in the Ninth Meeting of the Latin American Association of Plant Science.

In July, 1974, Dr. R. Abrams traveled to Santo Domingo, Dominican Republic to participate in the Annual Meeting of the American Society of Horticulture, Tropical Region.

#### VI. IMPACT OF GRANT SUPPORTED ACTIVITIES IN ACHIEVING GRANT PURPOSE

The grant supported activities are considered an integral part of the overall effort of the Agronomy Department. As a result of this, the majority of the staff members and also a group of Undergraduate and graduate students have shown a keen interest in contributing or getting involved in the grant program, regardless of the sources of individual funding.

The grant has strongly influenced the teaching program since it has stimulated the offering of a new option in the department in the area of Crop Protection. This new option will consist of eleven and twelve courses at the undergraduate and graduate levels, respectively. As a matter of fact, in our new revised curriculum three of these courses

are required for all students majoring in our department. By providing improved laboratory facilities, audio-visual equipment and increased library resources, the grant has favorably enhanced the quality of teaching. As a direct result of this, the number of graduate students in the area of crop protection in legumes is actually five, two more than our original plans.

Teaching and research laboratory facilities have been improved significantly since the implementation of the grant. New laboratory facilities, including five greenhouses, were made available for students and staff members at the College Farm during this year for research and teaching. The laboratory facilities for plant pathology and nematology in our main building have been redesigned and will be available for our students during the second semester of academic year 1974-75. As a direct result from this, we anticipate a further increase in the number of students both graduate and undergraduate majoring in crop protection.

Two new staff members have been appointed and a new one will be appointed in the near future with grant funds. At the termination of the grant all these staff members will have tenure with the University of Puerto Rico and the experience gained in the performance of grant activities will continue to be available to the institution. Two technical assistants also appointed with grant funds, will remain with the institution and their experience will be an asset for the field and laboratory research

program of the department.

Grant funds have been used to provide travel support for staff members. This provides a twofold benefit for the institution and the program: (1) by broadening the professional experience and establishment of professional contacts with scientists from other countries and universities and (2) new linkages and possibilities of new joint research projects in Central America which are under consideration at the present time, as well as exchange of information and materials with domestic and foreign scientists.

#### VII. OTHER RESOURCES FOR GRANT-RELATED ACTIVITIES

The grant contributes to the overall teaching commitments of the Department of Agronomy of the University of Puerto Rico. As the chief goal of the grant is to strengthen the existing competency the funds provided by this grant cannot replace existing funds for current projects. On the contrary activities carried under this grant have been additive to existing programs at the University.

In direct support to the grant, the University has been providing and will continue to provide:

1. Administrative costs including salaries and utilities in all administrative officer and facilities. The basic salary of the project leader, Dr. Raúl Abrams, \$23,244.00 comes from University budget. No funds from the grant are used to cover costs of services of senior administrative officers in the College of Agricultural Sciences.

2. Access to all persons concerned or related to the grant to relevant laboratories, field research facilities, and libraries. The facilities of the Agricultural Experiment Station and its substations are also available. The field research under the grant is using a one acre plot at the Isabela and Lajas Substations. This lands will be provided free of charges for the grant program. The services of the Central Analytical Laboratory of the Agricultural Experiment Station and of the Nuclear Center of the University are also available free of charge. Money wise, these contributions are very difficult to asses and they are not shown in Table 1.
3. Office, classroom, laboratories, and other space for faculty, students and special meetings related to the new program. In addition the University provides to all persons concerned or related to the grant all services and facilities that are normally provided to the regular staff and to the regular students. These contributions are also very difficult to asses and are not shown in Table 1.
4. The members of the faculty in the Agronomy Department not directly funded by the grant are considered an integral part of the grant program. These salaries, \$29,026.28, are shown in Table 1 as university support to grant supported activities.
5. The sub-professional personnel of the Department who are under university state funding are considered also an integral part of the grant program and take part in related activities. Their salaries are also shown in Table 1.

#### VIII. UTILIZATION OF INSTITUTIONAL RESPONSE CAPABILITIES IN DEVELOPMENT PROGRAMS

A. Since this grant was initiated in October, 1973, most of this first year's time schedule has been used for the implementation of the operational plan of the grant, i. e, recruiting the professional staff, graduate students, technical assistants and the preparation of the

research projects.

From October 29 to November 9, 1973, the Grant Director complied with a request of the Specialist in Agricultural Research of IICA of the Organization of American States (OEA) to visit El Salvador, Nicaragua and Panamá. The purpose of this visit was to evaluate the edible legume program for Central America and to implement a joint research project with pigeonpeas (Cajanus cajan Millsp.) in these countries. The joint research project actually established is a variety, date of planting, plant population study. Additional material for selection was sent also to Panamá.

B. During the academic year 1973-74 the College of Agricultural Sciences had a total of 47 graduate students of which 26, or approximately 55 percent were from LDCs. They came from the following countries: Nicaragua, 5; Venezuela, 5; Dominican Republic, 5; Brazil, 1; Colombia, 4; El Salvador, 2; Panamá, 3; and Cuba 1.

The State Senate Agricultural Commission and the Senate President visited the Isabela and Lajas Substations to get acquainted with the agricultural research projects, among them the 211(d) soybean experiments. They expressed great interest for the research program at both places and were favorably impressed with the work conducted with soybeans.

The participants to the Soybean Workshop held on February 1974, visited Isabela and Lajas Substations to look at the soybean research program conducted in these locations. The group consisted of more than 50 scientists representing 13 different countries, where soybean is grown.

Dr. Marcial Rico from Lajas Substation served as consultant to Mr. John Dixon and David Antongiorgi, farmers from the Lajas Valley that are engaged in soybean winter nursery business in their farms.

#### IX. NEXT YEAR'S PLAN OF WORK AND ANTICIPATED EXPENDITURES

Teaching: Final approval of our revised curriculum and new option on Crop Protection will be tramited through the Academic Senate of the University.

A senior staff member in the area of plant physiology, weed control, will be appointed to teach graduate and undergraduate courses and to initiate research work in this area.

The University of Puerto Rico will continue cooperation on joint projects with the University of Illinois during 1974-75. Three faculty members and a graduate student will visit the University of Illinois to offer seminars and get acquainted with staff members and facilities. Cooperation will be offered to University of Illinois for organization and participation in the Soybean Production Protection and Utilization workshop to be held in Addis, Abada, Ethiopia, from October 14-17, 1974.

In addition the following effort will be continued:

- 1) New courses on the subject of crop protection will be offered.
- 2) Training and teaching materials will be acquired to complement course offerings.
- 3) Physical layouts and facilities will be added or modified.
- 4) More graduate students will be recruited.
- 5) New laboratory facilities and equipment will be developed to support teaching and research activities of the program.

It is intended that all staff members will attend scientific matters of mutual interest thus increasing their capability to work toward the development of a soybean for the tropical and subtropical regions of the world.

It is estimated that the anticipated expenditures related to the above mentioned activities will be as follows:

Salaries:

Professional	\$ 37,260.00
Graduate Assistants	9,000.00
Technical Aids	11,160.00
Clerical	4,680.00

Stipends:

Fringe benefits	5,000.00
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Travel:

Domestic	5,000.00
International	10,000.00

Departmental Support:

Equipment	\$ 15,000.00
Library and teaching aids	2,000.00
Supplies, Materials and Services	2,000.00

Research

Laboratory and field trials in the area of plant pathology and nematology will be conducted at Mayaguez, Isabela and Lajas Substations.

The close collaboration and cooperative projects in the area of cultural practices of soybeans, initiated with the University of Illinois will be continued.

It is estimated that the expenditures related to the above mentioned activities will be as follows:

Wages (Field laborers)	5,954.63
Supplies, Materials and Services	3,000.00

X. INVOLVEMENT OF MINORITY PERSONNEL AND WOMEN

The grant has provided opportunities of employment for one woman in a clerical position at the department and one graduate assistant majoring in plant pathology. Our future plans related to the graduate assistant are to incorporate her as part of our staff in the department as soon as she obtains her Ph. D.

Table 1

Distribution of 211(d) Grant Funds and Contributions From Other Sources of Funding\*

Reporting Period October 1, 1973 to September 30, 1974

Grant Objectives/Outputs	211(d) Expenditures			Projected to end of Grant	Non 211(d) Funding* Amount
	Period Under Review	Cumulative Total	Projected Next Year		
Research	23,276.37	23,276.37	57,477.16	300,000.00	21,500.00
Teaching	37,291.61	37,291.61	41,997.16	127,000.00	10,080.00
Libraries	198.98	198.98	2,000.00	20,000.00	
Travel	7,683.07	7,683.07	15,000.00	53,000.00	
Total	68,450.03	68,450.03	116,474.32	500,000.00	31,580.00

\* These figures are our best estimates

Table II - A  
 211(d) Expenditure Report  
 Actual and Projected Summary  
 Under Institutional Grant #AID/ta-G-50

	Expenditures to Date		Projected Expenditures				Total
	Reporting Period	Cumulative Total	Y E A R				
			2	3	4	5	
Salaries	32,116.47	32,116.47	68,074.53	75,000.00	80,000.00	82,000.00	336,191.00
Employees Benefit	669.03	669.03	5,000.00	6,000.00	6,000.00	7,000.00	24,669.00
Travel & Subsistence	7,683.07	7,683.07	15,000.00	10,000.00	10,000.00	10,000.00	52,683.07
Supplies & Mat.	3,116.11	3,116.11	5,000.00	5,000.00	5,000.00	5,000.00	23,116.11
Research Support	24,865.35	24,865.35	15,000.00	9,158.49	7,158.49	7,158.49	63,340.82
							500,000.00

Table II - B

211(d) Expenditure Report

Reporting Year Detail

Under Institutional Grant #AID/ta -G-50

Reporting Period Oct. 1, 1973 to Sept. 30, 1974

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I. A. Salaries

<u>Academic</u>	Percentage time	Amount 10/1/73-9/30/74
R. Abrams		\$2,400.00
P. Meléndez	50	7,539.44
V. García	50	1,027.00
B. <u>Clerical</u>	100	4,290.00
<u>Technical Aids</u>	100	8,432.94
C. <u>Fringe Benefits</u>		669.03

II. Student Support

Ivonne Shattuck	U. S. A.	3,000.00
Federico Cuebas	Dominican Republic	3,000.00
Ernesto Leypón	Nicaragua	2,137.09

III. Guest Lecturer

One		290.00
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IV. Travel

A. Domestic		
Six		2,764.69
B. Foreign		4,918.38

V. Equipment

Trinocular Microscope		4,469.30
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Cont. Table II-B

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	Percentage time	Amount 10/1/73-9/30/74
VI. Library Acquisitions		\$ 188.80
VII. Publications		Done
VIII. Other		48.72