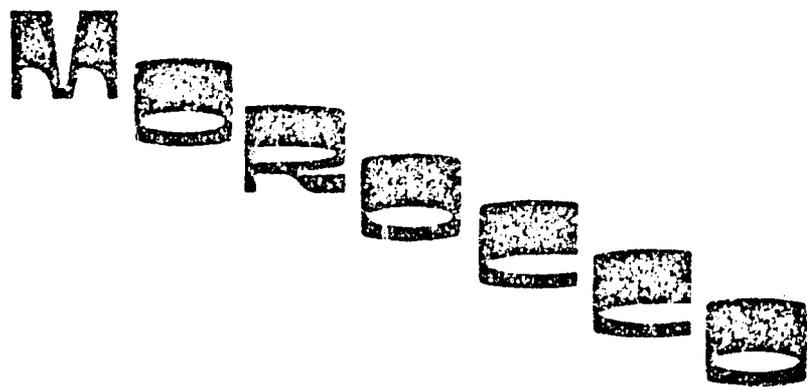


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HIGHER AGRICULTURAL EDUCATION

in



ANNUAL REPORT, 1977-1978

Contract No. AID/NE-C-1279
Phase II, FYII Annual Report
1977-1978
UNIVERSITY OF MINNESOTA

Annual Report

October 1, 1977 - September 30, 1978

Higher Agricultural Education in Morocco, Phase II

FY II Annual Report, 1977-78

(Contract AID/NE C-1279)

Prepared by University of Minnesota

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I. INTRODUCTION

The University of Minnesota, since June 1970, has been providing assistance under AID Contract to Morocco's Institut Agronomique et Veterinaire, Hassan II (IAV). This report covers the period October 1, 1977 - September 30, 1978: the second year of the current contract, Higher Agricultural Education in Morocco, Phase II (NE-C-1279).^{1/}

The objectives of the project are:

1. To develop within the Moroccan system of higher agricultural education, a Moroccan teaching and research capability to train students in soil and plant sciences.

2. To train, primarily in these fields, needed manpower to increase food production and improve the nutrition status of the population.

To this end the University of Minnesota has provided a resident field team, on campus backstopping, consultants and participant training services. These various activities during the year are reported below.

In general the year was highly successful. This was the first full academic year for current resident staff members. Major improvements were registered in project administration, participant selection and training (identification and academic programs) and in-country objectives as detailed below. Relationships with IAV have continued to be excellent and major strengthening of understanding of the value of U.S. agricultural science and teaching methods has occurred.

^{1/} For a detailed account of Phase I and of the first year of Phase II, which was essentially a transitional year, see University of Minnesota, Higher Agricultural Education in Morocco, Phase II, FY I Annual Report, 1976-1977.

II.1 ACTIVITIES OF RESIDENT STAFF

Throughout the year the University provided a resident team of four persons in Morocco:

Dr. E. Berglund, Watershed Management (arrived July 1977)

Dr. A. Lasheen, Horticulture (arrived July 1977)

Dr. J. O'Rourke, Rangeland Management (arrived July 1977)

Dr. J. Vavra, Soils & Field Team Leader (arrived July 1977)

During the year and in accordance with the contract staffing plan two further resident team members were recruited and provided with 13 weeks of intensive french language training in St. Paul:

Dr. J. Burleigh, Plant Pathology (arrived Aug. 1977)

Dr. L. Gallagher, Plant Breeding (arrived Sept. 1978)

Both new staff members received modified AID orientation programs in Washington prior to departure. These newly arrived staff members are now developing work plans for 1978/79 and their activities will be reported on in the 1978-79 Annual Report.

The activities of each of the resident staff members is discussed below.

SOIL CONSERVATION: DR. J. VAVRA

Prior to Dr. Vavra's arrival in July 1977, the Institute (IAV) had no teaching or research program in Soil Conservation. On September 1, 1977, IAV employed Mr. Abdelaziz Merzouk as a staff member and a counterpart to Vavra. Mr. Merzouk graduated from IAV in July 1977 and had obtained a M.S. degree (from the University of Minnesota) as a participant under the contract.

During the past year Dr. Vavra's activities were directed towards meeting the objectives of projects in the area of Soil Conservation. The following are some of Dr. Vavra's principle activities during 1977-78:

- (1) Assisted Mr. Merzouk in developing an undergraduate (fourth year course in Soil Conservation as a background to a third cycle course in Soil Conservation. Merzouk taught the course.
- (2) Assisted the Soils Department staff in the development of a third cycle curriculum in Soils with Soil Conservation as one of the majors. If approval is received from IAV Administration third cycle teaching may begin in the 1979-80 academic year.
- (3) A Departmental Seminar was developed and implemented.
- (4) A memoire project was developed for third cycle student, Mohamed Laabdi, entitled, "The effect of soil erosion on the accumulation of sedimentation in the Tleta watershed reservoir". The memoire was completed in July 1978. Mr. Laabdi's memoire was given a rating of 16 (out of 20) placing it in the upper level in comparison to the rating of other memoires in the Institute. Mr. Laabdi's study showed that the siltation of the newly developed (two years old) Tleta reservoir was progressing at an alarming rate and documented the economic losses to the farmers of plant nutrients (nitrogen, phosphorous and potassium) and organic matter. Mr. Laabdi presented his findings at the "Soil Conservation Day" conference held at IAV. The memoire is being prepared for publication in the Moroccan Soil Science Society Journal.
- (5) Two fourth year students were selected (one majoring in Soil Conservation and the other in Soil Fertility) for third cycle training in the United States 1978/79.
- (6) The requirements for the third cycle training program for Mohamed Bazza (Soil Physics) and El Haj Tavouga (Soil Fertility) were

coordinated. Both began their third cycle training in the U.S. in August 1977. Dr. Vavra who assisted in the development of a memoire topic for Tayouga who returned to Morocco in September, 1978. Mr. Bazza is expected to complete the M.S. degree in the U.S.

- (7) A research project entitled, "Evaluation of Soil Conservation Cultural Practices" was developed. Soil conservation is a major problem for Moroccan agriculture. This research is situated in the Tleta watershed. The dam on the Tleka River is in danger of being completely silted within a very short period - as soon as 13 years. The purpose of the project is to determine what management practices could be used in dryland farming to reduce topsoil erosion as well as increase farm income. The initial phases of this project were implemented in 1977-78. The project, consisting of three treatments and three replications is being conducted on a cooperative farmers' fields. The three treatments used are a control with wheat as a test crop (management and crop were identical to that used in the farming area), the same cultural practice as the control but with an application of nitrogen, phosphorous and potassium and the third treatment an annual forage mixture of winter vetch and forage oats with phosphorous and potassium added. The input of fertilizer (treatment No. 2) in comparison to the control (treatment No. 1) resulted in the grain heading out two weeks ahead and, at one period of height measurement, produced twice the average height of the wheat plant (51 cm vs 107 cm) and virtually covered the surface of the soil due to increased stooling. Data from the grain yields are being processed and are not yet available. The third treatment

representing forage with adequate fertilizer, produced an excellent soil surface cover. The farmer-cooperator used his field as a demonstration to other farmers of the village.

Runoff collecting equipment were not available during the initiation of the first phase of the project. Thirteen sets of runoff equipment were located in Tanger (DRA). This equipment along with metal aprons (now being constructed at IAV) will be used for cropping year 1978-79. With the runoff measuring equipment available during the next cropping year, water, soil and nutrient losses will be measured. The number of treatments and locations will be increased.

- (8) Participated in "Soil Conservation Day" conference in April 1978. This was the first program of this type held in Morocco. Of the 11 presentations made during the day, four (Laabdi, Merzouk, Vavra, Blake) were the direct result of the activities of the Project. Over 60 technical workers attended with Mr. Zaki, Director of Eaux et Forets serving as Chairman of the conference. This conference stimulated interest in cooperative soil conservation research and resulted in the development of a National Research Program in Soil Conservation.
- (9) Presented a paper entitled, "Atmospheric losses of nitrogen from soils" at "Nitrogen Day" conference held at IAV in May 1978. Sixty-five technical workers attended.
- (10) Developed working relationships with other agencies, such as, FAO, World Bank, DRA, DRE, and Departments within the Institute (such as Agronomy, Hydrology, etc) for the implementation of cooperative

teaching and research programs.

- (11) Participated in a 5-day international conference (organized by and held at IAV) on Soil Conservation and Watershed Management, September 1978. The conference was sponsored by UNESCO and research personnel from 11 Mediterranean countries participated.

Dr. Vavra, as Field Team Leader, also had administrative responsibilities for in-country project operation (see below under Administration).

HORTICULTURE: DR. A. LASHEEN

(1) Staff Development and Training.

Staff development in the Department of Horticulture at IAV remains one of the most important aspects of the activities of the horticulturist on the Minnesota Team. Two members of the faculty, Mr. Walali Loudyi and Mr. Abderrahman Hilali, left to the U.S. in late July, 1978 to start their PhD programs at the University of Minnesota. These are the first two participants sent under the project for PhD level work in the United States.

Mr. Walali will specialize in fruit physiology with emphasis on tissue culture. He will be advised by Dr. Cecil Stushnoff of the Department of Horticultural Science & L.A., with the possibility of some additional course work at the University of California, Davis, prior to his return to Morocco.

Mr. Hilali will specialize in vegetable breeding and will be advised by Dr. David Davis at the University of Minnesota. In the case of Mr. Hilali, it is much easier to envisage him carrying out his PhD research in Morocco under the direction of Dr. Lasheen and Dr. Davis - provided the latter be able to visit Morocco periodically.

(2) Third Cycle Training

A third cycle student, Mr. Achaboun Mohamed, is presently continuing his graduate work with Dr. Davis. His course work and research have been progressing

satisfactorily and he is expected to return to Morocco sometime during 1979.

The title of Mr. Achaboun's memoire is "Effect of Nitrogen Level and Variety on Quality of Cucumber Pickles".

Four fourth year students were selected for graduate training in the U.S. this year. They departed Morocco in late July to participate in the intensive English training course offered by the U of M before the beginning of the fall quarter. Their graduate training will continue during the 1978-79 academic year.

In April 1978, two student participants, Mr. Skiredj Ahmed and Mr. Choukr-Allah Redouane, returned from training at the University of California, Davis. Prior to their return they collected their research data and reviewed literature needed for their memoires. Dr. Lasheen arranged an extended field trip for both to visit the tomato production areas in Morocco. The experience and information gained from the trip were very useful for their memoire presentation. In mid-July both successfully presented their memoires. Both Mr. Skiredj and Choukr-Allah were invited and did join the faculty at IAV.

(3) Curriculum Development and Teaching

In view of the expected move of the Horticultural Program to the new Horticultural Center at Agadir now under construction, and the absence of a Moroccan faculty trained at the PhD level, graduate training (third cycle) will not be feasible before the return of the first faculty participants in 1981-82.

Second cycle (undergraduate) training is being handled by the two new Moroccan faculty, Skiredj and Choukr-Allah and the expatriate faculty including Dr. Lasheen.

A relatively large number of second cycle students will major in horticulture this year including 17 fourth year students. The Minnesota Horticulturist will have his share of those students who are expected to do memoire research. Dr. Lasheen participated during the year in all the horticultural "stage" trips of second and third year students.

(4) Research Development

Research development in horticulture at IAV has been hampered by some basic constraints. The most serious of these are the many unsettled questions regarding the move to Agadir. However, during 1978-79 major research activities involving two long term projects was carried forward as described below.

Establishment of a Plant Collection and Germplasm Bank

Until the opening of the new institute in 1979 in Agadir this project will continue to be semi-dormant. In the meantime the Minnesota Team Horticulturist is in correspondence with colleagues in the USDA Plant Introduction and the Universitites of California and Florida to explore ways and means of plant introduction from the U.S. to Morocco, a difficult process at best.

Planting Olive Trees to Reduce Soil Erosion in Rain-Fed Slopes

This project was started last January and has been progressing normally. Leaf and soil samples were sent to the U of M for analyses. Preliminary results of soil analysis indicate abundance of P and K in these badly eroded soils, but very low N. Leaf analysis show adequate levels of both P and K which may indicate the availability of these two elements for uptake, N, however, was

extremely low suggesting that element to be limiting to healthy growth and subsequent better crops. Yield data and more leaf sample collection will be obtained in the fall and spring, respectively. A repeat of this experiment is planned for next year with possibly one or two students participating.

Research projects of two third cycle students, Mr. Skiredj and Mr. Choukr-Allah, were started at Davis, California and completed for memoir presentation at the Institute. The title of Mr. Skiredj's memoir is "Effect of Sources of Nitrogen - Especially Slow-Release-Nitrogen-Fertilizers -- on Maturity, Yield, and Fruit Size of Fresh Market Tomatoes", and the title of Mr. Choukr-Allah's memoir is "Potassium Foliar Spray on Tomatoes". Papers are being prepared from these memoirs for possible publication in a Moroccan and/or American journal. Dr. Lasheen also served on three other memoir committees.

(5) Other

Other activities of the Horticulturist have included various administrative chores (acting as Team Leader during Dr. Vavra's absence, discussions with IAV administration, visits to Agadir to advise on plot land lay out, arabic language translation for other team members and students, etc) and a principle responsibility for participant selection and orientation as Team Training Officer.

WATERSHED MANAGEMENT: DR. R. BERGLUND

Dr. Berglund's primary activities in the past year focused upon third cycle teaching-related and research efforts plus numerous miscellaneous activities which directly or indirectly assisted overall project accomplish-

ments. Teaching-related activities included:

- 1) Encouraging the chairman of the Department of Soil Science to expand the departmental seminar series to include the talents of individuals from outside the Institut working in other governmental organizations.
- 2) Provided sixth year students with the opportunity to develop laboratory skills while analyzing data for their memoires. The first four years at IAV normally provide little or no hands-on laboratory work for students.
- 3) Assisted Mr. M'Hamed Tayaa, IAV counterpart in developing a basic course in climatology which was first presented in the winter 1978.
- 4) As a Team member, helped present seminars, interviewed four year students, and participated in the final selection of these students for scholarships to U.S. universities.
- 5) Helped Mr. M'Hamed Tayaa and Mr. Mohamed Oussible (Agronomy) develop proposed PhD programs in anticipation of their selection to return to the University of Minnesota in September 1979 on the faculty training program.

Research activities included one major project resulting in a memoire for a third cycle student and three additional acitivites. Dr. Berglund's research activities were:

- 1) The development, continual field guidance, and supervision of data analyses on the relative infiltration rates of range and forest cover types in the Tleta Basin between Tanger and Tetouan, Morocco. A third cycle memoire by Mr. Abdelaziz Ahyoud, resulted from the project. Mr. Abdelaziz Ahyoud completed his fifth year studies at the Univer-

sity of Arizona and returned to IAV in September 1977 to complete his third cycle training in watershed management under the direction of Dr. Erwin R. Berglund. A research project was developed which investigated the relative infiltration rates of two range and one reforestation cover types in the Tleta Basin between Tanger and Tetouan, Morocco. Field studies beginning on 16 November and ending 28 April employed three double-ring infiltrometers fabricated at IAV.

Infiltration rates, soil samples, and vegetation cover measurements were collected at each sample point per cover type. Laboratory analyses were performed on the soil samples for soil moisture, bulk density, per cent organic matter, and textural analysis. Data analyses within and between sites revealed highly significant improvement in relative infiltration rates and site characteristics resulting from reforestation. The memoire was defended 27 July 1978 before a jury of 7 members with a final and exceptionally high grade of 17/20. A paper is currently being written for submission to the Journal of Range Management.

- 2) A grid of 44 erosion pins was established last October in the Tleta Basin to evaluate the effectiveness of the erosion monitoring techniques and the general magnitude of surface soil erosion on the range lands. The plan was to measure the seasonal soil losses after the winter rain period. A revisit to the site in April 1978 revealed an absence of erosion pins. Two conclusions may be entertained: one, on-site erosion exceeded 20 cm last winter and removed the erosion pins along with other coarse materials, or, two, intense range utilization provided shepherds the opportunity to scrutinize every

square centimeter (the approximate area of the head of an erosion pin) of soil surface and, now, a family in the Tleta Basin is pinning together a bigger and better home! A lesson from this project is that for any semi-permanent or permanent installation of instrumentation on site surveillance is necessary to assure its safety.

- 3) Preliminary groundwork has been laid for two studies to be conducted by two third cycle students returning from the University of Minnesota. Mr. Mostapha El Haib and Mr. Mohamed Lahlou will be investigating precipitation-runoff relationships and suspended sediment characteristics, respectively, of one small watershed in the Tleta Basin.
- 4) An infiltration study with a portable rainfall simulator is being developed with Mr. M'Hamed Tayaa and Mr. Aziz Merzouk. It is planned to be operational by winter-spring 1979.

RANGE MANAGEMENT: DR. J.T. O'ROURKE

Dr. O'Rourke's activities during 1977-78 were principally concentrated on the advising of third cycle students and related memoire research. These activities included:

- 1) Memoire research of sixth year students in Morocco.

Mr. Abdelouahad El Gharbaoui

In order to determine the response of alfa (Stipa tenacissima), in terms of carbohydrate reserves and vegetative production, to various heights and intensities of clipping, one site of slightly over 1 hectare was selected on the Talsinnt Research Station. Despite numerous requests which resulted in the same number of

promises, fencing was never obtained. In each of 5 replications, untreated plants were clipped to heights of 1, 5, 10 and 15 cm from the first node each month from December through May. At each monthly clipping, plants cut in previous months were also recut to the same heights. Aerial production and carbohydrate storage organs were collected at each treatment period and analyzed for total production plus regrowth and total nonstructural carbohydrates, by the student in laboratory facilities established by Dr. O'Rourke. Data was analyzed statistically through computer facilities of CFA, Rabat. Due to the complexity of the topic and time necessary to complete the study under Moroccan conditions, completion of the Memoire and its defense is slated for late October 1978. A paper based on this work has been submitted and accepted for presentation by the student at the Annual Meeting of the Society for Range Management in Casper, Wyoming, in February, 1979.

Mr. Esserhini Laraisse

Despite inadequate technical experience available in Morocco, a sheep diet study, utilizing esophageal fistulated animals, was conducted at the Timahdite Research Station to determine the selection of individual forage species by sheep during the months of March, April and May in the Genista vegetation type of the Moyen Atlas. Six sheep were fistulated by Rabat and Meknes veterinarians. Two of these animals died due to lack of daily care by herdsman. A third animal was too wild to use. On a 0.5 hectare plot fenced by the student with fencing acquired at Kenitra, vegetation available in the field each month and diet samples of sheep over five days

each month were collected. Microscopic analysis of diet samples was conducted by the student at IAV laboratory facilities. Ratios of each forage specie's relative presence in the field as compared to its importance in the diet, were determined. Statistical analysis of data was conducted at DRA, Rabat, and Recherche Forestiere, Rabat, computer facilities. Snowfall in the Moyen Atlas prevented initiation of the study prior to March. Completion of the Memoire, and its defense, are scheduled for late October, 1978. A paper based on this work has also been submitted and accepted for presentation by the student at the Annual Meeting of the Society for Range Management in Wyoming in 1979.

Mr. Bourass Boujemaa

Dr. O'Rourke also acted as Memoir Advisor to Mr. Boujemaa, a fourth year student at Meknes. This student conducted a study at the Talsinnt Research Station and presented his Memoire in July, 1978. This study concerned the correlation between woody and forage production of Artemisa herba alba and such dimensional measurements as maximum height of the plant, maximum diameter, maximum diameter perpendicular to the previously mentioned maximum diameter, volume of the plant (product of the first three measurements), average diameter, and line intercept. Data was collected each month from December, 1977, to May, 1978, and regression equations determined for each dimensional measurement on production for each month of the study. The results will enable field technicians to determine monthly production by measuring that dimensional measurement which most accurately predicts production for a given month. This is much quicker and less

costly than trying to clip, separate, and weigh the very small but numerous leaves produced by sagebrush. The quality of the results obtained and conclusions drawn were quite good although the paper was poorly written. This student received a 17, a relatively high mark, for the Memoire and its presentation.

2) Development of Academic Programs of Students in U.S.

By extensive correspondence and personal contacts a program was developed for Mr. A. El Maghraoui at Oregon State University where he is reported to be doing well. He is scheduled to return to Morocco in March 1979 when he will carry out studies on sheep diets as affected by grazing intensity.

Mssr. M. Bouknafer and A. Omekloul departed for the U.S. in July 1978 for third cycle studies. It is intended that once they master the english language they will transfer to Washington State and the University of Idaho, respectively.

Programs have also been developed for two faculty members, Mr. Narjisse and Mr. Berkat, to return to the U.S. for PhD work. Graduate School applications for both have been initiated with Texas State, Utah State and Colorado State Universities.

The attendance of Dr. O'Rourke at the First International Rangeland Congress, at Denver, Colorado in August 1978 greatly facilitated detailed discussions of these plans with Deans, Department Heads and advisors of these students.

3) Other Research

Timahdite Forage Adaptability Trials

In November, 1977, Dr. O'Rourke and Mr. Narjisse planted three

replicates of 32 varieties with 10 more varieties planted by Narjisse in February 1978. Results were dismal due to either excessive fertilizer or improper planting depth. These trials will be refined and repeated in October, 1979, providing seed arrives from Dr. George White, USDA, Beltsville, Maryland.

Timahdite Grazing Rate Trials

With the help of Dr. E. Berglund and Mr. Hamid Narjisse, pastures for a trial including three grazing rates in two replicates, were surveyed and staked out in June, 1978 at the Timahdite Research Station. Fencing wire was donated from Kenitra acquisitions, with posts and labor to be provided by the Moroccan government. To date the first post hole is yet to be dug.

4) Other Activities

Development of Departmental Support Facilities

The Kenitra acquisition, along with supplies and equipment supplied through the Project, have enabled the establishment of a range laboratory. Together with equipment already available at IAV, carbohydrate analysis is now possible. The previously moth eaten and inaccessible herbarium has been moved to another room, organized, and fumigated. It is now only inadequate in holdings. The library, also inadequate in holdings, is now organized in an improved shelving system. The Department is now on the mailing list of all Federal and State Range research organizations in the Western U.S. and a current publications/ordering/reading shelf system has been organized. Student study and writing space has been provided in the library. Space for the laboratory, herbarium, and library became

available not because of new facilities provided by IAV, but by 2-3 departmental staff members sharing office space and thus freeing previously private roomy offices.

First International Rangeland Congress

In August, 1978, Dr. O'Rourke presented a paper at this Congress entitled "Grazing Rate and System Trial Over Five Years on a Medium-Height Grassland in Northern Tanzania". O'Rourke also accompanied third cycle student, Mr. Abdelaziz El Magraoui, on the Pre-Congress Tour through Arizona and New Mexico visiting numerous research and ranching facilities. As reported above, considerable time at the Congress was spent formulating programs for third cycle and PhD students.

English Language and Orientation of Fourth Year Students

Dr. O'Rourke also participated in general participants selection by arranging for three potential PhD candidates who had some previous experience with the English language, to take the TOEFL test in Rabat. He also organized informal meetings and seminars held between the Team and potential new third cycle students from the fourth year class while encouraging greater concern for English learning. This resulted in extra, voluntary classes being held. He arranged for a special English test to be given by USIS to the entire group interested in U.S. training. This enabled a comparison of relative English skills not possible through existing IAV English testing procedures.

11.2 ACTIVITIES OF SCIENTIFIC ADVISORS

A key feature of the project and which contributes much to project success is the use of on-campus scientific advisors (Department Heads). There are also senior individuals in addition to the Department Heads in each of the academic departments who provide essential professional linkages between the University faculty and the staff resident in Morocco in such matters as work plan development, research, student advising, curriculum development and the like.

Scientific advisors review annual work plans of resident team members, supervise purchasing and shipping of equipment, evaluate requests for consultants, scientific travel, etc., and coordinate participant training programs of students in their fields. The scientific advisors played a major role in the hiring during 1977-78 of the two new staff members and conducted uncompromising searches for qualified individuals that were fully acceptable as members of the departments to the department faculty. Through the scientific advisors resident team members are assured of as complete an integration and identity with their home departments on campus as is possible, not only in matters of scientific importance, but also in administrative matters such as annual evaluation and pay adjustment. The support and understanding of the scientific advisors is not only crucial to project success in terms of the quality of professional advice and support in in-country operations and participant training, but also critical to integrating the Morocco project into the Departments of the College of Agriculture and the maintaining of vigorous support and understanding by the faculty.

II.3 ACTIVITIES OF SHORT TERM STAFF

No short term staff activities were funded under the project during 1977/78. However, the returned staff members of the University now back on the St. Paul Campus - Dr. Antoine, Lockhart and Molina - continued to be active in student advising (particularly with doctoral students), corresponding with team members and colleagues at the Institut and developing collaborative research. Dr. Antoine made a visit to Morocco on an OIP research grant for continued work on the Moroccan soil survey and Dr. Molina developed a \$75,000 research proposal (with Dr. Schmidt, University of Minnesota) in collaboration with Mr. Hilali of IAV, which has been funded by CRS/USDA, for research in Morocco and Senegal on enhanced food legume production in LDC's. Both of these activities were at no expense to the contract and are examples of "spin-off" activities that the project is expected to create in the future.

II.4 ACTIVITIES OF CONSULTANTS

During the year the following consultants were provided under the contract to assist resident staff members in project design and execution:^{1/}

Dr. George Blake (March 31 - April 21, 1978) - Soil Conservation

Dr. Robert Bechta (June 15 - July 15, 1978) - Watershed Management

Reports from these consultants were filed with USAID and IAV. Copies are available from the College of Agriculture, University of Minnesota.

Dr. George Blake, Professor of Soils, in the Department of Soil Science, University of Minnesota, spent three weeks in Morocco in April 1978 as a Consultant to the Soil Conservation Program and to the Project in general.

^{1/} M.D. Torell, range nutritionist, arrived in Morocco on September 29, 1978 for a 3 week consultancy to Dr. J. O'Rourke. His activities will be reported on in next year's annual report.

As a senior member of the Soil Science Department he was able to give valuable assistance in evaluating research and teaching programs. Dr. Blake presented a seminar to the IAV staff on "Minimum Tillage" and to the Soil Conservation Day Conference on "Soil Conservation Cultural Practices". This visit to Morocco has given him a better background to supervise the training of soil science majors at the University of Minnesota.

Dr. Robert L. Beschta, Oregon State University, provided watershed management consultant services from 16 June to 14 July 1978. He reviewed the specific problems pertinent to the studies of Mr. El Haiba and Mr. Lahlou, the potential Ph.D. studies for Mr. Tayaa in the Tleta Basin, the potential expansion of research into the Moyen Atlas mountains and into the arid pre-Sahara region of Talsinnt.

Dr. Beschta presented two seminars and counseled with Mr. Tayaa and Mr. Ahyoud. He reviewed possible third cycle offerings at IAV in watershed management. An intensive 10 hour period was spent reviewing Mr. Ahyoud's infiltration data resulting in detailed outlines for data analyses and interpretation. The seminars provided personnel from IAV, Sale School of Forestry, Eaux et Forets, and Direction de l'Hydraulique with practical considerations of stream sedimentation problems, innovative techniques for data analyses, and new instrumentation techniques for watershed management research. Dr. O'Rourke also obtained advice from Dr. Beschta on possible cooperative studies between Range and Watershed Management.

During the visit to the Talsinnt Research Station, a revision was proposed in the planned exterior boundary so as to allow a complete watershed to be included. Later discussions with Mr. Henri Chaudet, who is responsible for the Station, resulted in his complete approval and wire obtained from Kenitra will be donated to supplement DRA fencing funds.

A request was made by Dr. O'Rourke for Mr. Don Torell, of the Hopland Research Station in California, to serve as a consultant in Range Livestock Nutrition. By the time approval was received for Mr. Torell's travel it was too late in the growing season for him to accomplish his mission. This activity was postponed until October, 1975.

II.5 PARTICIPANT TRAINING PROGRAM

During FY-II 18 participants arrived in the United States for advanced training. Four of these are faculty members of IAV who initiated PhD level programs. By the close of FY-II, a total of 40 participants trained under the project and returned to Morocco and 25 continued in U.S. training, for a total of 566 participant months.

Fifteen of the 36 participants who have taken third cycle studies in the U.S. have been assigned to the Institute faculty upon completion of their programs contributing to the Moroccanization of the system. These assignments are in Soil Microbiology - 1, Horticulture - 3, Watershed Management - 2, Range Management - 3, Plant Pathology - 3, Soil Conservation - 2, and Watershed Management - 1.

Specialization, location and stage of program are given for all participants in Appendix 1.

Faculty Programs

Faculty participants initiating PhD programs include Soil Microbiology - 1, Plant Pathology - 1 (citrus virology), and Horticulture - 2 (one in

breeding and one in fruit crops). Applications were submitted for five additional PhD programs, Range Management (2), Watershed Management, Plant Breeding and Plant Pathology.

One faculty person of the Ecole Nationale Forestiere at Sale completed an MS in Forest Economics.

Third Cycle Programs

Twenty-nine third cycle students participated in U.S. training during the year. Four of these were sixth year students, eleven were in their fifth year and fourteen arrived for intensive English language in late July. Among the eleven students completing their fifth year studies, four returned to Morocco, four will continue part of their sixth year work in the U.S., and three will complete their third cycle in the U.S. Preparatory to fifth year studies in FY-III, fourteen students arrived and participated in intensive English language during August and September. Although these students improved an average of fifteen points on a scale of eighty, only one achieved the level required for full-time academic studies. One continued full-time language, nine half-time, and three quarter-time language during fall term. Their level of achievement reflects low initial language proficiency since their progress equals that of previous years' participants.

Fifth year specializations during FY-II included, Agronomy (Dryland) - 1, Plant Breeding - 1, Horticulture - 2, Watershed Management - 2, Range Management - 1, Forestry - 2, and Soil Science - 2. Specializations planned for FY-III include Horticulture - 4, Plant Pathology - 4, Soil Science - 2, Plant Breeding - 1, Forestry - 1, and Range Management - 2. Sixth year programs during FY-II included Plant Pathology - 2 and Horticulture - 2.

II.6 VISIT OF PRESIDENT MAGRATH

In July 1978, C. Peter Magrath, President of the University of Minnesota, made a brief inspection visit to Morocco. Although this visit was not at contract expense it contributed substantially to project achievement by reinforcing GOM understanding of the University's commitment to Morocco and the project as well as providing opportunity for President Magrath to obtain first hand knowledge of contract activities. President Magrath was received by his Majesty, Hassan II, and made a two-day field trip to Agadir in addition to visits and discussion with the Institute, with Minnesota staff members and with returned participants (alumni). The Mission and the United States Embassy were continuously helpful in arrangements for this visit. President Magrath was received by Ambassador Anderson who also offered a luncheon in his honor.

II.7 PROJECT ADMINISTRATION

The project is administered by a campus based Project Director. During the year Dr. Pierre Antoine served as Project Director under the supervision of Dr. J.F. Tammen, Dean of the College of Agriculture, University of Minnesota. Effective July 1, 1978, Dr. Malcolm J. Purvis was appointed Project Director and Assistant Dean for International Programs and assumed full responsibility for project management. During the year inspection trips to Morocco were made by Dean Tammen (December 1977 and July 1978) and one inspection trip was made by Dr. Purvis (July 1978). These inspection trips were primarily for the purpose of reviewing project accomplishments with the Mission and for discussions on work plans and budgets. A number of trips were made to Washington, D.C. for similar purposes with the Near East Bureau and the Contracting Office.

The project was supported by one senior accounts specialist on campus (Mrs. J. Borris). A statement of expenditures during the year are given in Appendix

In country administration, including payments of local project cost coordination with the Mission on administrative matters and general responsibility for resident staff members is the responsibility of Dr. Vavra as Field Team Leader, in addition to his activities as a soil scientist. In order to spread some of this load Dr. Lasheen has been given the administrative responsibility for participant training, as in-country equivalent of Dr. Sentz, College of Agriculture International Training Officer. Dr. Berglund has responsibility for project car maintenance and operations. Three well used R-4s were replaced in August and September by Mission supplied Pinto runabouts.^{1/} Dr. Berglund continues to perform all routine maintenance on project vehicles on an overload basis. A local hire administrative assistant was engaged during the year and has been most helpful in facilitating administrative matters, in bilingual typing and accounting.

Dr. Vavra, Field Team Leader, made one visit to St. Paul Campus for consultation (March 1978) to aid in final work plan and budget preparation.

II.8 MISCELLANEOUS

The emergency travel provisions of the contract were invoked on two occasions during the year. Mr. O'Rourke has to travel to the United States on medical grounds and Dr. Vavra as a result of the decease of his wife Anne Marie Vavra.^{2/} In both instances the help of the Mission and the U.S. Embassy in responding to the emergency conditions was much appreciated by everyone associated with the project.

^{1/} An initial spare parts inventory has been shipped to Morocco: spare parts being generally unavailable in Morocco.

^{2/} Dr. Vavra visited the St. Paul Campus prior to his return to Rabat.

III. PRINCIPAL ACCOMPLISHMENTS

The year 1977-78 was a good one for the project. It was the first full academic year at IAV for the four team members that arrived in July 1977. By the end of the year, with the arrival of Drs. Gallagher and Burleigh, the team was finally at full strength. The resident team worked effectively in building project acceptance, with returned sixth year students, and in identifying new fourth year students to depart as third cycle participants. Much of the student advising and scientific work under the project has been described above. The following is a brief description of other contributions to project implementation and success.

III.1 ACCEPTANCE OF PROJECT IN MOROCCO

One of the major achievements during this reporting period was the improvement in the relationships between the University of Minnesota contract staff in Morocco and the personnel of IAV and the AID Mission, Morocco. Working relationships are extremely cooperative and productive. There is total support for the project by IAV administration and a desire to have the project broadened to include other disciplines in the Institute, e.g., animal production, veterinary science. Moroccans trained in the USA have demonstrated to IAV that they are capable and eager to carry on teaching and research work. They appear to be superior (in practical orientation) in these activities in relationship to others trained under a different educational philosophy.

In early years it had been difficult to attract sufficient numbers of qualified students for third cycle training in the U.S. There has been a gradual improvement in student attitudes, particularly as they have heard

favorable comments from returned sixth year students. In fact in 1977-78 over half the graduating class of 45 indicated a strong desire to go to the United States. The operational plan and budget for 1977-78 called for 10 participants in the second cycle. At Mission request the University agreed to send an additional four since it had qualified candidates. The 14 students that were selected ranked high in the class (with one exception but who was highly recommended in his field). The 14 third cycle students that were sent to the U.S. in 1977-78 is just over one-quarter of all of the 53 third cycle students sent during the life time of Minnesota project since 1972 (See Appendix 1).

The departure of the first two faculty members, in July 1978, to the United States for Ph.D. level training was a milestone in the history of the project. The Director of IAV, during President Magrath's visit, indicated for the first time a desire to have not just a few but the majority of the future faculty of the Institute trained in the United States. This is a revolutionary development in the Institute's appreciation and understanding of the value of U.S. agricultural science and teaching/research methods. It is expected that eight faculty members will start Ph.D. level studies in the U.S. during the 1978-79 academic year. All students will prepare, in the first instance, for the written comprehensive exams in their department. What will follow is yet to be determined, but it is envisioned that in most cases dissertation research will take place in Morocco under the direction of one or more of the resident Minnesota faculty. It appears that this will have to be decided on a case by case basis and with the active involvement of student's advisory committee. The availability of local research funds, equipment, field plots and Moroccan and/or American expertise in the subject matter of the

student's research problem will be but few of the many constraints that will have to be taken into consideration.

III.2 FOURTH YEAR STUDENT SELECTION

An improvement of participant selection procedure was achieved this year. The Minnesota field staff met with all those fourth year students, individually and in groups, that expressed some interest in U.S. training. At those meetings the field of interest of each student, his English speaking ability and his overall attitude regarding graduate study in the U.S. were determined.

English training and testing were offered by four English teachers hired by IAV. Student performance, progress and scores were taken into consideration by the Minnesota team members in making their selections.

In light of the above, and the students' third year academic records and whatever could be obtained of their fourth year records, each Team Member was able to make an evaluation and selection of participant candidates interested in his discipline(s). A final list of candidates was then given to the Institute prior to a faculty-administration meeting in which the field of study and the country where third cycle training of each student are determined. The Team's recommendations regarding the 14 participants who eventually left for Minnesota were all accepted with no exception at that meeting. As it has been done every year, the meeting took place in late July following final exams and posting of grades. Only then is formal nomination provided by IAV and names of candidates submitted

to the AID Mission in Rabat for processing. Although further improvements need to be made in this process (see next section) this years effort was a major step in the right direction.

III.3 PROJECT ADMINISTRATION

Some major improvements were made in project administration during the year in areas in which AID had expressed some dissatisfaction in the past. For example:

- (1) Participant Quarterly Progress Reports are now sent directly to OIT/ Washington, the Mission and the field team and are arriving in a timely manner.
- (2) Quarterly financial reports are being sent by the Office of Research Administration of the University of Minnesota within two months or less of the end of the quarter. Informal monthly reports are being sent out by the College Office within two weeks of the end of the month.
- (3) Greater care is being exercised in seeking timely advanced approvals and notification from the Contract Office, as required by the Contract.
- (4) Inventory records are being initiated and developed for non-expendable equipment purchased under the contract. An attempt is being made to establish inventory records back to Phase I of the project 1970-76.
- (5) Tighter procedures are being used in planning for consultants and establishment of terms of reference for the more efficient use of consultants time.

As a result of these improvements and other changes contractor relationship with the Mission and with AID/Washington have passed from good to excellent. There is a feeling, that this is not just the "Minnesota" project but rather a shared, joint activity between AID/IAV/U of M based on equality of relationship and common commitment to project goals.

III.4 OTHER

The Field Team secured for IAV 13 truckloads of redundant office supplies and research materials valued at over \$120,000 from the closing of the U.S. Naval Base at Kenitra. Materials included such items as 25 tons of barbed wire, 6 portable buildings, 41 kg copper scour chain, 6 refrigerators, 6 freezers, 8 pieces of shop machinery, 1 3M photo copier, 1 overhead projector, 6 typewriters, 8 computer card files, 30 file cabinets, 25 desks, 20 desk chairs, 20 free-standing shelves, 15 units of glass-fronted book-cases, 8 cleaning mops and buckets, 7 tables, 25 storage lockers, 3 map cases, 1 disc plow, 1 horse trailer, 47 sediment and runoff collection drums, and 2 meteorological tower sections.

US AID's cooperation permitted appropriate documents to follow normal channels in processing the materials. IAV promptly responded with trucks to transport these goods back to IAV. The Field Team found it necessary from February through September to be responsible for cleaning, repainting, and personally distributing the goods into the various departments in which it is now located.

This material has made a significant improvement to office working conditions in the Institute as well as an important contribution to research equipment. Previously many IAV staff members, including Minnesota faculty, had no desks, files or bookcases.

Title to this equipment, since it was not provided through contract funds has been turned over to the Institute. Although this was a rather unusual and exceptional activity, the Institute has been a major beneficiary of U.S. surplus equipment, thanks to the vigorous efforts of team members, and this has further reinforced the Institute appreciation for the work of the resident staff and its understanding of their commitment to the Institute.

IV PROBLEMS ENCOUNTERED

Although as reported above significant progress was made during 1977-78, a number of problems continue to present themselves and to hinder project implementation. The more important of these are discussed below.

IV.1 EARLY PARTICIPANT IDENTIFICATION

The final nomination of students for third cycle training by IAV is not made until the last few days of July. This creates a mad scramble to issue visas, DSP 66's, etc., and to dispatch students to St. Paul within about 72 hours for entry into the intensive summer English as a Second Language (ESL) program. Far more seriously it creates considerable difficulty in making timely application to graduate schools for admission and in identifying potential advisers and even the majors in which arriving students are to work. This lack of leadtime also may prevent students from adequately preparing themselves for arrival in the United States in terms of prior language training and cultural adjustment.

Experience has shown that the Moroccan students do remarkably well in the ESL program and after only six weeks are, on average, at about a 70 level on the Michigan Tests (a gain of about 15 points over their arrival scores). Not surprisingly almost all students have to spend part or all of their fall quarter in additional English language courses to reach the desired level of 80. This not only erodes the already limited time available for their academic programs in their fifth year but also creates problems of course sequencing and for transfer of students to other universities (many of which do not have ESL programs available during the entire academic year).

The earlier identification of students, nomination and selection by the Institute would help ease some of these problems. However, this would require major modification of the internal grade system of the Institute, much of which is prescribed by statute. It is inevitable that interfacing the Moroccan third cycle system with the U.S. graduate school system will always create a less than perfect meshing and give rise to some "frictions" of these kinds. Nevertheless, further improvement could be made in this area. The efforts of the Institute and the resident team during 1977-78, as reported, has been an important development in the right direction.

IV.2 PROJECT ADMINISTRATION AND PLANNING

There was considerable delay in reaching agreement and obtaining approval of work plans and budgets for the year under review. In fact, the contract amendment was not sent to the University for signature until June 31, 1978, so that for nine months of this year the contract was operating without a formal, approved budget. This delay was due to a combination of poor communications, some rather trivial differences of understanding between the USAID and the University and a few substantive questions of disagreement. However, the completion of negotiations on work plans and budget for next year, 1978-79, were accomplished in an expeditious and timely manner and this problem has not reoccurred.

Of far greater concern is the limitation imposed on project planning by the contract itself. This report covers the second year of the current three year contract. At the close of the year, with one more year to go on the existing contract,

the contractual time horizon is impossibly short for a project of this kind. For example, resident faculty are in a situation of not knowing whether their contracts will be (can be) extended, the project is bringing faculty and students to the U.S. on faith that there will be sufficient follow-up to make the initial investment worthwhile, the annual budgeting horizon creates some unnecessary and artificial "tunnel vision" to project development and management.

These problems are not, of course, unique to this contract. Nor is the University free from all responsibility for its severity. For example, the absence of any faculty on tenure track amongst the resident staff creates some of the need for a long term planning horizon (it is also true that longer term planning horizons would also help solve it).

Undoubtedly, these and other questions will be addressed by the external review to be carried out in October/November 1978. The University of Minnesota welcomes this review with a firm conviction that it is on the high road to success but continually needs advice and assistance in project improvement and execution. The Higher Agricultural Education Project antecedes Title XII but nevertheless, in spirit and design, it is a Title XII project. The University for its part, in recognition of this fact, would like to see greater development of project design and administration along the lines being suggested by BIFAD, such as the Collaborative Assistance mode of contracting, greater specificity and monitoring of project outputs by USAID and a greater flexibility and freedom over inputs by the contractor.

IV.3 FRENCH LANGUAGE SKILLS

The resident team continues to be hampered by lack of French language

skills. Although, this has little effect on their working relationships with many third cycle students and departmental faculty, since they speak English as a result of previous U.S. training, it does effect ability to communicate with the faculty and students in other departments and with officials outside the Institute. Continued efforts need to be made by the resident team for improvement in their French language skills. Steps have been taken to bring this about during the coming year.

It may be unrealistic to expect that adult scientists with no prior ability in the French language can easily attain sufficient fluency to teach advanced graduate level courses which clearly requires great skill and and precision in communication. However, it is not unrealistic to expect all resident staff to have a conversational fluency as an important attribute for effective operation in Morocco.

IV.4 INSTITUTE MANAGEMENT

As the Institute grows in size and complexity, it is becoming increasingly apparent that centralized decision making and budget control will not be viable organizational modes in the future. As departments increase in size of faculty and students many decision making powers will be devolved to the department head and faculty. This is a normal process of institutional growth and development but one which the project should be prepared to assist with. Invitations have been made to senior administrators at the Institute to participate in short courses/training programs in the U.S. and it is hoped that some just steps in this direction will occur in 1978-79.

IV.5 RESIDENT THIRD CYCLE INSTRUCTION

The enrollment in the third cycle program at IAV has been growing. From about 45 graduating fourth year "seniors" in 1978 there will be an increase to 75 in 1979 and to 100 in 1980 and on. The increase in size of the third cycle program not only requires the development of resident fifth year instruction in some fields, but also makes it possible. Previously with only two to three students in any one discipline (let alone field) resident instruction was hardly practical or economic. With the increase in enrollment this picture is changing. The efforts to train the IAV faculty under the contract become additionally urgent in this context. It is reasonable to believe that some third cycle instruction can begin at the Institut with the help of the resident team and other external assistance in the near future. (However, the IAV will never be totally "self contained" in all disciplines and fields in its training programs and will continue to need to send some students to other institutions not only to bring back specific educational experiences, but also as a means of maintaining contact with other systems, instructional methods, schools of thought, etc.).

The contribution that the contract must make to this development (in the fields of its activities) is a critical one. There remain a number of questions to be resolved as to the rate and pace at which third cycle instruction can and should be developed. Apart from the problems of French language skills alluded to above, the whole matter of making English a medium of instruction for the third cycle, for valid scientific reasons, is under active review by IAV. This would greatly facilitate contract effectiveness in this area by making possible, for example, teaching by short term staff, consultants, etc, and not just by resident staff with developed French skills.

IV.6 OTHER

The closing of the Kenitra base has resulted in increased difficulty and time in shipping and communicating between the United States and Rabat. Even air mail frequently takes over 2-3 weeks, giving a round communication a delay of upto one and one-half months. Aggressive use of telex and cables have reduced communication lags for project purposes, although it remains a problem for personal communications of resident staff. Shipping of project materials to the resident staff has been reduced to absolutely essential items but experience of working through Moroccan customs, with assistance from IAV, has been very good.

APPENDIX 1. PARTICIPANT TRAINING

- Participants of the Higher Agricultural Education Project in Morocco, 1974-78
- Status of Moroccan Participants in the United States September 30, 1978

APPENDIX 1

PARTICIPANTS OF THE
HIGHER EDUCATION PROJECT IN MOROCCO
1974-78

COMPLETED THIRD CYCLE TRAINING & RETURNED TO MOROCCO

<u>IE</u>	<u>YEAR</u>	<u>SPECIALTY</u>	<u>PRESENT EMPLOYMENT</u>
LAHLOU, Mohamed	1974	Photointerpretation	Eaux et Forets
SAADOUI, El Mostapha	1975	Plant Pathology	D.R.A.
BOULIF, Mohamed	1975	Plant Pathology	D.E.A.F.P. (Meknes)
BERKAT, Omar	1975	Range Management	I.A.V. (staff)
ISMAILI, Mohamed	1975	Range Management	D.R.E.
HILALI, Abdelali	1976	Soil Microbiology	I.A.V. (staff)
EL YOUSOUFI, Mustapha	1976	Range Management	S.N.D.E.
BENCHEQROUN, Najib	1976	Virology	I.A.V. (staff)
ABOU FIRASSI, Mohamed	1976	Hydrology	D.R.E.
BANI AAMEUR, Fouzia	1976	Plant Breeding	D.R.A.
AANANE, Aissa	1976	Soils	Direction de la Mise en Valeur Agricole
ATIQUI, Mohamed	1977	Range Management	D.R.E.
HALLATOU, Mohamed	1977	Horticulture	I.A.V. (staff)
IBNELMOUATA, Azzouz	1977	Plant Breeding	D.R.A.
OUSSIBLE, Mohamed	1977	Horticulture	I.A.V. (staff)
OMERANI, Abdeslam	1977	Soils	Eaux et Forets
TAYAA, M'Hammed	1977	Watershed Management	I.A.V. (staff)
ZAHOUR, Ahmed	1977	Plant Breeding	I.A.V. (staff)
MERZOUK, Abdelaziz	1977	Soil Conservation	I.A.V. (staff)

SIXTH YEAR STUDENTS BACK IN MOROCCO DURING 1977/78

<u>NAME</u>	<u>SPECIALTY</u>
20. AHYOUND, Abdelaziz	Watershed Management
21. LAABDI, Mohamed	Soil Conservation
22. HARIDI, Brahim	Plant Protection
23. SKIREDJ, Ahmed	Horticulture
24. CHOUKR-ALLAH, Redouane	Horticulture
25. TAYOUGA, El Jah	Soil Fertility
26. GOURIMATE, Mohamed	Soil Science
27. LARAISSE, Esserhini	Range Management
28. EL GHARBAOUI, Abdelouahed	Range Management
29. ACHOURI, Mohamed	Plant Pathology
30. EZZAHIRI, Brahim	Plant Pathology

SIXTH YEAR STUDENTS IN U.S. ON SEPTEMBER 30, 1978 (TO RETURN 1978/79)

1. JLIBENE, Mohamed	Plant Breeding	University of Minnesota
2. ACHAHBOUN, Mohamed	Horticulture	" "
3. BAZZA, Mohamed	Soil Physics	" "
4. DAALI, Allal	Forestry	" "
5. EL MAGHRAOUI, Abdelaziz	Range Management	" "
6. KHATOÛRI, Mohamed	Forestry	" "
7. KELILI, Driss	Plant Pathology	" "
8. EL HAIBA, Mostapha	Watershed Management	" "
9. LAHLOU, Mohamed	Watershed Management	" "

FIFTH YEAR STUDENTS IN U.S.

(ARRIVED JULY 1978 TO RETURN 1979/80)

- | | | |
|-----|---------------------|--------------------------|
| 40. | AMBRI, Abdel-Ilah | Horticulture (Veg.) |
| 41. | AMRI, Ahmed | Agronomy (Breeding) |
| 42. | BARHMI, Kouider | Soils |
| 43. | BERRE, Abdellatif | Food Technology |
| 44. | BOUKHNAFER, Monamed | Range Management |
| 45. | CHERIGUI, Ahmed | Forestry |
| 46. | EL-OTMANI, Mohamed | Horticulture (Citrus) |
| 47. | EL-YAMANI, Mohamed | Plant Pathology |
| 48. | FARIH, Ali | Plant Pathology (Citrus) |
| 49. | JELLAL, Naima | Soils |
| 50. | MEDOUAR, Mohamed | Pomology |
| 51. | MOUJANE, Rahal | Plant Pathology |
| 52. | OUMEKLOUL, Ahmed | Range Management |
| 53. | RAMMAH, Abdellah | Nematology (Citrus) |

FACULTY TRAINING DURING 1977/78

BENCHEGROUN, Najib	Third cycle student returned to U.S. for Ph.D. training, September 1978, Plant Pathology
HILALI, Abderrahmane	Ph.D. student in Horticulture, arrived July 1978
WALLALI-LOUDIYA, Dou	Ph.D. student in Horticulture, arrived July 1978
HILALI, Abdelali	Third cycle student, returned to U.S. for Ph.D. training, September 1978
ESSIDIQI, Mohammed	M.S. training at Syracuse in Forest Economics, due to return in October 1978

Note: Special programs were arranged in previous year for:

NARJISSE, Mohammed	Range	5 month program, 1976/77
TABET, Abdelaziz	Hydrology	5 month program, 1976/77
STITOU, Mohamed	Soil Classification	12 month program, 1976/77

APPENDIX 1

STATUS OF MOROCCAN PARTICIPANTS IN THE UNITED STATES
Minnesota Contract AID/NE-C-1279, Morocco

September 30, 1978

FACULTY in Ph.D. PROGRAMS (All Arrived Fall-1978)

1. BENCHEQROUN, Najib - University of California-Riverside, Plant Pathology specializing in virology - Dr. E. C. Calavan, adviser.
Mr. Bencheqroun did part of his third cycle studies at Riverside and is planning to do his research on citrus or related viruses.
2. HILALI, Abdelali - University of Minnesota, Soil Science specializing in microbiology - Dr. Jean Molina, adviser.
Mr. Hilali did part of his third cycle studies at Minnesota with emphasis on soil microbiology. His Ph.D. research will be concerned with the ecology of Rhizobium japonicum in relation to its inoculation into the soybean and will be accomplished primarily in Morocco.
3. HILALI, Abderrahmane - University of Minnesota, Horticulture with emphasis on potato and vegetable breeding - Dr. F. Lauer, adviser.
This is Mr. Hilali's first U.S. study experience. He participated in the Minnesota Intensive English Language Program during Summer-1978 and achieved a Minnesota score - 87 and TOEFL score - 507.
4. WALALI-LOUDIYI, Dou El Macane - University of Minnesota, Horticulture with emphasis on fruit science - Dr. Cecil Stushnoff, adviser.
This is Mr. Walali's first U.S. study experience. He participated in the Minnesota Intensive English Language Program during Summer-1978 and achieved a Minnesota score - 74 and TOEFL score - 480. He is currently taking two courses in English.

FACULTY ADVANCED STUDY

ESSEDDIQI, Mohamed - SUNY-Syracuse, Forestry with emphasis on economics - Dr. John Petriceks, adviser.

Mr. Esseddiqi completed an M.S. degree and will return in October 1978 to the School of Forestry in Sale where he holds a faculty position.

THIRD CYCLE STUDENTS

Sixth Year Programs (Arrived August, 1977)

1. ACHAHBOUN, Mohamed - University of Minnesota, Horticulture with emphasis on vegetable production - Dr. D. Davis, adviser.

Mr. Achahboun will complete major portion of sixth year study and memoir at Minnesota and return to Morocco in April-1979 to complete his program there.

Sixth Year Programs (Continued)

2. BAZZA, Mohamed - University of California-Davis, Soil Science with emphasis on soil water relations - Dr. D. R. Nielson, adviser.
Mr. Bazza will complete the M.S. degree at California and return to Morocco in December-1979.
3. DAALI, Allal - University of Minnesota, Forestry with emphasis on silviculture - Dr. E. I. Sucoff, adviser.
Mr. Daali will complete his third cycle studies at Minnesota and return to Morocco in June-1970.
4. EL HAIBA, Mostapha - University of Minnesota, Watershed Management - Dr. K. N. Brooks, adviser.
Mr. El Haiba will return to Morocco in December-1978, to complete his third cycle studies with Dr. Erwin Berglund.
5. EL MAGHRAOUI, Abdelaziz - Oregon State University, Range Management with emphasis on annual type ranges - Dr. W. C. Krueger, adviser.
He will return to Morocco in April-1979, to complete his program.
6. KELILI, Driss - University of California-Riverside, Plant Pathology with emphasis on chemical control - Dr. J. W. Eckert, adviser.
He completed third cycle program at Riverside and returned to Morocco, October 31, 1978.
7. KHATOURI, Mohamed - University of Minnesota, Forestry with emphasis on silviculture - Dr. E. I. Sucoff, adviser.
He will complete third cycle program at Minnesota and return to Morocco, June-1979.
8. LAHLOU, Mohamed - University of Minnesota, Watershed Management - Dr. K. N. Brooks, adviser.
He will return to Morocco in December-1978 to complete his program with Dr. Erwin Berglund.

Fifth Year Programs (Arrived July, 1978)

1. AMRI, Ahmed - University of Minnesota, Plant Breeding with emphasis on cereals, wheat - Dr. Robert Busch, adviser.
English Scores: Minnesota - 71, TOEFL - 443.
2. AMBRI, Abdel-Ilah - University of Minnesota, Horticulture - vegetable production - Dr. D. Davis, adviser.
English Scores: Minnesota - 70, TOEFL - 417.
Participant expected to take some courses at University of California.

Fifth Year Programs (Continued)

3. BERRE, Abdellatif - University of Minnesota, Horticulture - food processing - S. Munson, adviser.
English Scores: Minnesota - 73, TOEFL - 437.
Program will be developed in cooperation with Food Science and Nutrition Department.
4. EL OTMANI, Mohamed - University of Minnesota, Horticulture - Dr. Cecil Stushnoff, adviser.
English Scores: Minnesota - 76, TOEFL - 437.
He wishes to specialize in citrus culture and program development with this emphasis being pursued at University of California-Riverside.
5. MEDOUAR, Mohamed - University of Minnesota, Horticulture - pomology, Dr. Cecil Stushnoff, adviser.
English Scores: Minnesota - 77, TOEFL - 463.
6. EL YAMANI, Mohamed - University of Minnesota, Plant Pathology - cereal virology - Dr. Ben Lockhart, adviser.
English Scores: Minnesota - 69, TOEFL - 383.
7. FARIH, Ali - University of Minnesota, Plant Pathology - citrus root rots - Dr. Ben Lockhart, adviser.
English Scores: Minnesota - 69, TOEFL - 447.
Program development with emphasis on his major interest is being pursued with University of California-Riverside.
8. MOUJANE, Rahal - University of Minnesota, Plant Pathology - bacterial diseases - Dr. Bill Kennedy, adviser.
English Scores: Minnesota - 57, TOEFL - 327.
Primary emphasis Fall term has been on English language.
9. RAMMAH, Abdallah - University of Minnesota, Plant Pathology - nematology - Dr. Dave MacDonald, adviser.
English Scores: Minnesota - 70, TOEFL - 490.
He is primarily interested in citrus nematology and program in this area is being pursued with the University of California-Riverside.
10. BARHMI, Kouider - University of Minnesota, Soil Science - conservation - Dr. George Blake, adviser.
English Scores: Minnesota - 70, TOEFL - 413.

Fifth Year Programs (Continued)

- 11. JELLAL, Naima - University of Minnesota, Soil Science - fertility -
Dr. Gary Malzer, adviser.

English Scores: Minnesota - 81, TOEFL - 480.
- 12. BOUKHNAFER, Mohammed - University of Minnesota, Range Management -
Dr. Carl Mohn, adviser.

English Scores: Minnesota - 70, TOEFL - 417.

Anticipate transfer to Washington State University, January-1979, for
program emphasizing range seeding and establishment.
- 13. OUMEKLOUL, Ahmed - University of Minnesota, Range Management - Dr.
Carl Mohn, adviser.

English Scores: Minnesota - 66, TOEFL - 413.

Program is being developed with University of Idaho with emphasis on
range production. Anticipate January-1979 transfer.
- 14. CHERIQI, Ahmed - University of Minnesota, Forest Products - Dr. John
Haygreen, adviser.

English Scores: Minnesota - 68, TOEFL - 377.

APPENDIX 2. BUDGET ALLOCATIONS AND EXPENDITURES, FY 1977-78

	Budgeted \$	Estimated Expended <u>1/</u> \$
1. Salaries & Wages		
On Campus	44,607	42,865.16
Regular Field Staff	143,002	143,490.30
Short Term Field Staff	0	0
Consultants	10,000	4,213.71
Local Hire	9,000	7,212.65
2. Fringe Benefits	37,632	23,475.58
3. Indirect Costs	62,849	61,028.95
4. Allowances	67,000	55,909.41
5. Travel & Transportation	67,500	47,241.53
6. Research	33,000	22,124.25
7. Other Direct Costs	22,500	21,263.28
8. Participants	180,000	168,093.13
TOTAL	<u>\$ 677,090</u>	<u>\$ 598,917.95</u>

1/ This is not a final expenditure, but best estimate as of 9/30/78 of actual expenditure and accrued obligations. Details have been communicated previously through informal monthly reports.

APPENDIX 3

PHYSICAL INVENTORY ACQUISITIONS, 1977-78

Non Expendable Equipment Procured
during 1977/78

Quantity	Item	Value ^{1/}
1	Wastewater Sampler	\$3,103.00
2	Stevens Type A Model 71 Water-level Recorders	\$2,503.50
1	Water Current Meter	\$ 597.50
4	Tipping Bucket Rain Gauges	\$2,591.20
1	Scale	\$ 75.00
1	Recording Rain Gauge	\$ 548.90
1	Water Level Recorder	\$ 526.90
	TOTAL	\$9,946.00

^{1/} Excludes shipping costs

Note: All items were shipped in 1977/78 and are in use at IAV.