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ANNUAL TECHNICAL REPORT

October 1, 1994 - September 30, 1995

Moroccan Cooperative Agricultural Development Project

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Submitted by the

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This Annual Technical Report for the Moroccan Cooperative Agricultural Development Project was prepared by the San Diego State University Foundation utilizing input from participants in the Kingdom of Morocco, the State of Israel and the United States of America.

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OVERVIEW

Project Description

The Moroccan Cooperative Agricultural Development Project is funded by the Agency for International Development Bureau for the Near East. Initiated July 1, 1992, the Moroccan Project is being accomplished by participants from the Kingdom of Morocco, the State of Israel and the United States of America and is designed to meet a number of national development priorities set by the governments of Morocco and Israel.

The goal of the project is to promote world peace through cooperation in agriculture. Specific objectives are to contribute to the development of Morocco's agricultural sector by the introduction of new technology, training and demonstration. The project constitutes a new stage in the Middle East Regional Cooperation program, introducing a new partner with Israel and the United States.

Accomplishments

Progress in comparison with the work plan and in comparison to the goals and objectives outlined in our original proposal, has been satisfactory for the period of October 1, 1994 - September 30, 1995. Project activities in December 1994 were slowed down in order to provide for an orderly transition period for personnel changes. However, in February and March 1995, activities at the farm resumed at a normal productive level. Accomplishments during this report period include:

General

- The Steering Committee (SC) met in Morocco on October 11-12, 1994; members visited the project site prior to the Committee meeting; project accomplishments and Technical Committee recommendations were reviewed; policy and priority activities were determined;
- the Technical Committee (TC) met in Morocco on August 23-25, 1995; members visited the project site in Azemour and the new project extension site in Agadir; detailed plans for the next six months activities were accomplished; plans for the final year of the program were discussed;
- contract required reports were submitted to USAID;
- Fall 1994 newsletter was prepared and distributed;
- external evaluation team was selected to conduct the mid-project review; review commenced on December 1994, at San Diego State University Foundation;
- external evaluation team made site visits to Israel and Morocco were made in January 1995;
- project management meeting was held in Casablanca in March 1995, to prepare an action plan in response to the mid-term evaluation report recommendations;
- project management and technical issues were reviewed in Casablanca by U.S. and Moroccan partners in May 1995;

- the Israeli and Moroccan coordinators met in June 1995 to review the technical progress at the project sites in Azemour and Agadir;
- informational meetings and calls with USAID project officers in Washington, D.C. and Rabat, Morocco were held;
- technical visits and training was accomplished by four Moroccans and two Israeli experts;
- personnel changes in January 1995 included a new Moroccan farm manager, new Israeli technical advisors and a new project assistant in San Diego;
- a new fiduciary agent for Maghreb Agriculture was hired to begin financial accounting as of April 1, 1995; Manay Maroc finished their fiduciary role as of March 31, 1995.

Specific technical accomplishments, in comparison to stated objectives, are detailed in the next section entitled, "Progress Report."

PROGRESS REPORT & WORK PLANS
for
MOROCCO

October 1, 1994 - April 30, 1995

The following is a summary of the **Objectives** for each activity that is to be carried out at the project site in Azemour, as detailed in the grant. Following the description of each objective is a **Progress Report to Date.** The progress report covers the period from **October 1, 1994 - September 30, 1995.** Work plans identify tasks to be accomplished during the period of October 1, 1995 - April 30, 1996.

TRANSPLANT NURSERY

Objective:

The high root/shoot ratio production by transplant seedling technology allows for optimal production from drip irrigation and a high rate of germination of expensive hybrid seeds. Planting of transplant seedlings one month later than direct field sowing reduces environmental stress on the plants and results in savings of water, fertilizer, herbicides and field preparation. Thus, introduction of this technology is intended to result in yield gains and cost savings to the vegetable industry.

A transplant nursery was erected in phases, with an initial capacity of one million seedlings per rotation supplied to farms in the target region. The size will increase five-fold during the project period. This activity is intended to influence the construction of similar nurseries in the country.

The nursery will specialize in the production of tomatoes, peppers, cucumbers, melons, and other crops to be identified. Experimentation will be directed towards the evaluation of locally produced growing media, utilization of fertilizers from various sources, and refinement of irrigation and management.

Progress to Date:

- production of 2 ½ million transplants in Azemour and 1 ½ million transplants in Agadir was accomplished - mostly tomatoes and a few melons and peppers; (See Attachment C for a list of clients)
- project activities are being focused on maximizing the transplant production activities; maximizing production involves improving the production of transplant material in Azemour, developing markets for the transplants in Azemour and in Agadir regions, developing a greenhouse facility in Agadir to harden the transplants in the pre-planted

trays, developing clients and providing them product information and follow-up advise. In support of these objectives the following accomplishments were made: the Moroccan partner located and purchased land for the greenhouse from his personal account, three bids were solicited for the greenhouse construction, construction of the greenhouse (3,500 square meters) commenced in June and was completed by the month-end, marketing activities were pursued (see below); a project sign for the Agadir greenhouse was made; an Amaris office was opened;

- development of a market strategy is an essential part of expanding the transplant nursery production capacity as well as the ornamental nursery production; as a result, a marketing specialist, Mr. Karim Lahlou, was identified in March 1995 and a preliminary marketing and sales strategy was developed. The plan was presented to the Technical Committee in August 1995;
- marketing contacts in Beni Mellal, Larche, Oualidiya, Ctouka and Agadir were pursued by Mr. Omar Mounaz, the Moroccan farm manager and Mr. Karim Lahlou, the marketing coordinator; working with grower cooperatives in Agadir to secure orders for transplants; growers were provided with product information and support; orders for two and a half million transplants were secured from growers; marketing materials were prepared (See Attachment A);

Work Plan:

- continue to develop the marketing strategy, establish contacts for sales, provide support services (pre and post sales) to clients of Amaris Nurseries in Agadir and Azemour;
- continued marketing of transplants in Azemour and Agadir;
- continued provision of follow-up assistance to clients;
- develop additional marketing brochures; prepare informational articles for agricultural newspapers in the region (in Arabic and in French); prepare other promotional literature;
- marketing in winter months will be targeted at the small producers and local markets; summer targets are large producers and the export market;
- complete the installation of necessary equipment for the green house in Agadir;
- improve technical capabilities and marketing of watermelon, pepper, and melons for transplant sales.

POT-PLANT NURSERY

Objective:

This activity is seeking to utilize Morocco's comparative advantage of mild winter temperatures, high level of radiation, and low labor costs to (a) compete for markets in Europe and neighboring countries and (b) expand the local market. The facility is also producing low cost, quality starters for the local market.

The pot-plant nursery is generating two types of products: rooted seedlings and finished pot-plants. It includes both a mother plantation and a production unit. The mother plantation, based on the highest quality species available, provides propagation material for the production unit. The production nursery is divided into a rooting section and a pot-plant production section.

Linkages will be developed with leading European nurseries, and ornamental lines, mostly rooted seedlings, will be produced according to orders from these nurseries. Production for the local market is concentrated on a line of easy to produce plants, with high quality seedlings being made available to local pot-plant producers and finished pot-plants also being produced.

Experiments includes the effects of dwarfing agents, utilization of local materials for plant growth medium, nutrition, and optimization of light and temperature. The nursery will be used for on-the-job training of a large number of farmers in the art of pot-plant production. It will also assist Moroccan farmers who wish to start their own nurseries.

Progress to Date:

- propagation of mother plants continued including the following varieties: Ficus Goldenking, Scheflera, Croton Goldstar, Croton Red and Amaranthus;
- based on the recommendations of the Technical Committee in August 1995, the pot-plants were sold; all future ornamental plants grown in the nursery will be rooted cuttings - these cuttings will be sold to local nurseries for a year in order to build a local market; then, rooted cuttings will be exported;

Work Plan:

- make follow-up contacts with local nurseries;
- continue to distribute product samples to local nurseries;
- tailor environment and management to improve quality and cost effectiveness;
- improve classification system of plants;
- prepare second green house for mother plants;
- install irrigation system in the second green house;
- prepare mother plant area for planting;
  select species and plant mother plants;
- start marketing rooted cuttings.

MICRO-PROPAGATION (Tissue Culture) LABORATORY AND HARDENING NURSERY

Objective:

Commercial cultivars of bananas and carnations can be multiplied only by means of vegetative propagation. Because micro propagation provides a means of quickly propagation disease-free material, banana and carnation growers in Morocco are importing expensive micropropagules since such material is not produced in Morocco.

Micro propagation is also used in the pot-plant industry. The intention of this activity is to develop commercial micro propagation capability in Morocco that will produce micropropagules from a variety of foliage and other pot-plants. The importance of this technology to Morocco and its availability in Israel make this activity an excellent opportunity for cooperation.

Progress to Date: Mid-term Adjustment

Construction of the micro-propagation laboratory will not be undertaken until the other activities of the program are realized and until the transplant nursery is running at full capacity as recommended by the mid-term evaluation committee. Resources originally targeted for the micro-propagation laboratory will be utilized to develop a transplant nursery in the Agadir region.

OPEN-FIELD PRODUCTION OF ORNAMENTALS

Objective:

This activity is focusing on the production of hardy woody ornamentals since (a) out-of-doors production of ornamental is attractive to small farmers due to low investment requirements, and (b) this segment of the ornamental industry is little known in Morocco. The project is concentrating on three species of melaleuca.

Trials on the 2-hectare site are devised to produce optimal irrigation and fertilization regimes and post-harvest treatment.

Progress to Date:

- market promotional activities were accomplished including the distribution of 20,000 melaleuca branches to flower shops in Casablanca and Rabat areas;
- export markets are being identified; Amaris will export branches to Europe and to Canada to test the market in the next season (October 1995 - May 1996);
- continued development of the Strelitzia including testing lower ph levels to improve the quality of the plant;
- sold 200 Strelitzia without pots in the Marrakech region.

Work Plan:

- continued development of Strelitzia; rogue plants and put selected cultivars in propagation house;
- continued development of melaleuca; test with saline water irrigation has been successful;
- contact additional flower shippers to take melaleuca sample lots to export markets;
- continue with weed control, using black plastic mulches.

OPEN-FIELD and GREEN HOUSE EXPERIMENTS WITH VEGETABLES

Objective:

This component includes experimentation, demonstration, and application of modern methodologies and technologies of open-field-crop production, addressing parameters of crop rotation, soil preparation, manuring and basic fertilization, seed-bed preparation, irrigation, herbicide application, flowering

manipulation, planting, fertigation, insect and disease prevention and controls, pollination, harvest timing, and post-harvest treatment.

The activity will seek to introduce a range of species and cultivars of vegetables for the processing industry. The main crops to be tested, improved and disseminated are fresh salad tomatoes and melons, cucumbers, and artichokes. Varietal trials for each group is being thoroughly assessed.

Progress to Date:

Open-field

- **artichokes** were planted for the purpose of plant production, then put into dormancy in December 1994;
- **raspberries** were put into dormancy in December 1994; they were replanted in March 1995; the plantation suffered in dormancy so an improved maintenance program was started resulting in full recuperation;
- **asparagus** was put into dormancy in December 1994; harvest will start in 1996; there are five varieties of asparagus being grown but it takes three years to produce strong plants);

Commercial Green-house Vegetable Production

- **melons** were produced in two green houses and sold in local and export markets;
- 5 varieties of open field nematode resistant **tomatoes** were tested; and additional 8 varieties were tested in the spring and summer 1995;

Work Plan:

- **asparagus** will be cut back until spring 1996; a spraying program to control rust will be undertaken; assess varietal response to blanching; prepare production guidelines for asparagus to disseminate to growers;
- **raspberries** will be cleaned and dead cane removed; improve maintenance program and continue production and record characteristics; introduce raspberry propagules for sale in the propagation nursery;
- **artichokes** will be rogued; compare quality and market acceptance to French cultivars; the artichokes will be sprayed with the GA hormone to induce early flowering - a new practice for Morocco;
- **tomatoes** varieties will continue to be planted for observation of varietal performance; continue field trials with grower field days to introduce determinate (bush) type with nematode resistance;
- melon filed trials will be discontinued.

TRAINING AND EXTENSION

Objective:

Training at the Azemour Project Site

All training at the project site will be carried out by a cadre of 10-15 Moroccan extension workers, drawing also on professionals from the Hassan II Institute of Agriculture and Veterinary Medicine and from the National Institute for Agricultural Research. Groups of farmers and farm technicians will be selected for extended on-the-job training at the project site in Azemour. Training will be provided on agronomic topics of general importance, and a training plan will be developed for each component. The Technical Committee will design the training, evaluate its effectiveness, and advise on equipment needs.

Short-term Project Site Courses of up to one week will be given on topics related to site activities. Examples are methods of plant propagation, maintenance of irrigation systems, fertilization, pest and disease control, farm management and marketing.

Extension Program

In addition to providing training as discussed above, the extension specialists will conduct an advisory service to farmers who cooperate with the project. They will be employed by the project and will work in various activities; their extension work will be in addition to their every-day job obligations. Extension will be carried out in at least three areas; plant protection, vegetables and ornamental production. The extension program will be devised by the Technical Committee.

Progress to Date:

- **weekly meetings** are held at the farm with technicians and the farm manager to review plans and provide in-depth discussion and direction; weekly meetings are held with the Moroccan Project Coordinator, the Israeli Technical Advisor and the Moroccan Farm Manager;
- **extension** information on transplants and production techniques are being provided to growers through the marketing and sales activities; (See Attachment B for an example of an extension technical report)
- **visits** to the project site are made daily by local farmers and potential clients; the Hassan II Institute director visited the project site in Azemour in April with a group of students;
- **publications** and informational bulletins have been produced and distributed to local farmers; (See Attachment A for an example of a promotional brochure for Amaris)

Work Plans:

- marketing and follow-up instructions on pre and post planting care of transplants will expand;
- weekly meeting will continue;
- training will continue;
- demonstration will continue;
- publications will be expanded to include variety specific information brochures for growers;
- extension equipment will be procured;
- a short course for farmers conducting intensive agriculture will be given by technical committee members in January 1996;
- field days will be given in late winter 1995-96 in Azemour to demonstrate the results of the experiments with different tomato cultivars;

Objective:

Training Abroad

The extension workers will initially be trained for three to four months in Israel, participating in classes, tours, and on-the-job training that focuses on extension methods.

Progress to Date:

- **Ms. Agdid** received an additional three months of training (Aug.-Oct. 1994) as recommended by the technical committee in June, in order to receive additional instruction in pot-plant propagation;
- **Mr. Ainin Hassan,** a Moroccan agricultural technician, was sent to Israel for two-months training in irrigation beginning October 1994.

Work Plan:

- Mr. Hammoutou will visit Israel to work with Mr. Spiegel

PROGRESS REPORT & WORK PLANS
for
ISRAEL

October 1, 1994 - April 30, 1995

Breeding of High Quality Tomatoes for Morocco

Objective:

The average yield of open field tomatoes in Morocco is 30 tons per hectare, while in Israel it is 80 tons per hectare. The studies on tomatoes to be carried out at the Moroccan site will be supplemented by the breeding of high quality tomato hybrids in Israel that are adapted to the environment of the Middle East and are nematode tolerant.

Progress to Date:

- selection of eight varieties of tomatoes was made in Israel from a total of 140 varieties;
- these eight varieties of tomatoes were tested in Azemour in 1994;
- continued testing of the tomato varieties will be done in 1995;
- a site visits to Morocco is scheduled for 1995 by the Israeli researcher for this project;

Work Plan:

- evaluations on varietal tests for adaptation to Moroccan conditions will continue, including disease resistance qualities and the agri-management practices;
- research efforts to breed hybrid tomatoes will continue.

Development of Verticordiaas an Ornamental Plant

Objective:

This genus has many species which produce attractive flowering branches and has good potential for becoming a novel product in the floral markets of Europe and North America. Studies are conducted on the effects of environmental and seed treatment on germination; edaphic and other environmental effects on plant growth and yield;

formulation of appropriate agro-management procedures; post-harvest studies; and markets. (The verticordia species of ornamental plant has not yet been introduced in Europe. The branches are very good for decoration with good vase-life. The plants are wild and indigenous to Australia. However, it takes up to two years to germinate and therefore, it is a challenge to domesticate.)

Progress to Date:

- the Israel scientist Mr. Yossi Ben-Dov, is scheduled to visit Morocco in May 1995 to work with Moroccan counter-part, Mr. Hammoutou El-Mekki; Mr. Ben-Dov evaluated the melaleuca and verticordia propagation, weed problems, and marketing prospects.
- verticordia plant materials continue to be tested in Israel;

Work Plan:

- research and evaluation will continue based on the prior accomplishments;
- new species will be introduced at the Azemour site.

Micro propagation of Ornamental Eucalyptus

Objective:

This work is conducted at a tissue culture laboratory of the Ben Gurion University which is also be responsible for training Moroccan technicians in methods of micro propagation, and advising on the construction and operation of the laboratory in Morocco. Results of this research will be applicable to the open-field ornamental production activity in Morocco.

Progress to Date:

- propagation of ornamentals continued;
- tissue culture propagation was initiated in Israel
- delays occurred in the testing of nine selected varieties due to poor sprouting in the Spring of 1993;
- from 100 seeds of Eucalyptus calophila - ornamental species, approximately 60 shoot cultures were initiated and established;
- a selection of superior varieties of Eucalyptus was made;

Work Plan:

- testing in Israel will continue;
- varietal selection will continue; field tests in Azemour will continue;

Commercial Production of Truffles

Objective:

Truffles are well-known and highly appreciated commodity in Morocco, and in Israel there is an on-going research aimed at the "domestication " of desert truffles. Intensive production of truffles will potentially introduce a new field on intensive agriculture production for both Morocco and Israel. This activity will seek to identify Moroccan scientists who would be interested in cooperating with Israeli research in this area, and to expand direct ties between involved research institutions in both countries.

Progress to date:

- eight fruiting bodies have been secured during the initial truffle collection trips to Morocco;
- Israeli scientist traveled to Morocco in March 1995 to collect additional truffle samples with the Moroccan counterpart, Dr. Mohamed Achouri, at Hassan II Institute in Agadir;
- a revised work plan was prepared by the Israeli and Moroccan collaborator;

Work Plan:

- Dr. Mohamed Achouri will visit Israel for additional work on the truffle project;
- tests will continue in Israel on the commercial production possibilities of the Moroccan truffle;
- additional tests will be made with other varieties of truffles;

Economic and Marketing Study

Objective:

This component will seek to demonstrate that satisfactory markets exist for the products being studied under the project. The Economic study will include and evaluation of the costs of the different products developed in the project, especially at the Project site in Azemour; yields and prices in the local and export markets; and returns to farmers for increasing the efficiency of the production will be developed.

The primary elements that will be considered in the marketing analysis are as follows: population projections of potential beneficiaries of the project; the numbers of beneficiaries that will be reached by the Project site activities; the income per farm unit among these beneficiaries; the long-term increase in income that can be projected as a result of project outreach; the internal rate of return on investment; the income generated from the three nurseries operated by the project (speedling, pot-plant and micro propagation); data on European Community import and consumption of project crops; and potential profitability of the project.

Progress to date:

- third draft of the study was distributed in January 1995.

Physiological and Nutritional Studies of Onions

Objective:

Onions are a major crop in the countries of the semi-arid Middle East. Recently developed onion hybrids have increased the potential yield of onions and their dry matter production. This activity will contribute to realizing this potential in full by developing management procedures on the basis of a better understanding of plant physiology and nutritional requirements.

Progress to Date: Mid-term Adjustment

To date, the work has been directed mostly for processing onions. However, the project is shifting priorities toward production of fresh market products in response to market demands. Therefore, the Technical committee recommended in June 1994, that this project be discontinued as of October 1994. In place if the onion research, an alternative study on Argan was proposed by the Technical Committee. The Steering Committee reviewed these recommendations and concurred. USAID approved this change in the scope of work.

Domestication of the Argan Tree (Argania spinosa) as an Oil Crop

Objective:

The argan is indigenous to areas of southwestern Morocco. Argan oil production has a high cash crop potential for Morocco and Israel, however, cultivation of argan is rare. The objective of this study is to determine the potential for domestication of the argan tree as an oil crop. Research will be conducted in Israel and Morocco by an Israeli researcher in collaboration with a Moroccan counter-part.

Plants at various Negev sites will be used for the research study. Specific objectives include: 1) to examine the establishment, yields and oil production or argan under various desert conditions; 2) to study its reproductive biology, especially factors associated with high oil content in the fruit; and 3) to select high productive clones for commercial plantations.

Progress to Date:

- the project Technical Committee recommended in June 1994, that an argan study be initiated in lieu of the existing onion study;
- concurrence for this change was secured from all members of the project Steering Committee;
- a work plan was developed;
- AID approval for study was requested in February 1995 and concurrence was given;
- a Moroccan counter-part was identified, Dr. Fouzia Bani Aameur, University of Ibnou Zohr, Faculty of Science, Agadir, Morocco;
- the germplasm collection activity in southwest Morocco was accomplished in April 1995 by Dr. Avinoam Nerd and Dr. Aameur;
- propagation of the samples will be made in both Agadir and Beer Sheva in order to establish test plots for the genotypes;
- research on trees already planted in Israel started in the spring of 1995;

Work Plans:

- Dr. Aameur will visit Israel in 1996 to work with the Israeli collaborator in the Negev to study existing yielding trees;
- continued work on argania will take place in Morocco and Israel.

WORK PLANS FOR THE FINAL YEAR OF THE PROJECT
May 1, 1996 - June 30, 1997

Work Plans

The fifth year work plan is divided into five topics: management, production, research, marketing, and outreach and cooperation.

1. PROGRAM MANAGEMENT

Resulting from the recommendations of the mid-term Evaluation Committee, the following changes the project management will be implemented:

Overall Management Policy. This task will be fulfilled by the Country Coordinators in project Year 5 in lieu of the Steering Committee.

Technical Committee. The Technical Committee will be reduced to two Israeli members, two U.S. members, and three Moroccans. The third Moroccan member will be a scientist from the Hassan II Institute facility in Agadir. The role of the Technical Committee will be expanded. Its members will also participate in cooperative outreach programs as described in the "outreach" section.

Project Site Management. The most significant change in the project's management is the one which has taken place at the Azemour site.

A qualified Moroccan Farm Manager has been hired and is responsible for all managerial activities at the site. A new Israeli resident Technical Advisor was hired. The Israeli Technical Advisor is responsible for the execution of all research activities at the site and provides technical advise upon request to the Farm Manager. The Farm Manager reports to the Moroccan Coordinator who has overall responsibility for the operation of the facility.

2. PRODUCTION

Vegetable Seedlings. In response to the recommendations of the Evaluation Committee, the production of vegetable seedlings was expanded to the Agadir area. The Agadir region is the largest production area for protected agriculture in Morocco and is the national customer for the Amaris nursery. A 3500 m^2 multispan greenhouse was constructed in Agadir during the summer of 1995. In the first season (summer through fall), the facility has produced 1.5 million seedlings. Work will continue in this facility as follows:

- A 1000 m^2 Israeli greenhouse structure, which was built in Azemour for hardening of the micropropagated plants, will be transferred to Agadir to increase the production area to 4000 m^2. The site will be connected to electricity and automated irrigation and ventilation equipment will be installed

- A facility for post seedling germination will be installed in Agadir. The transplant production target for Year 5 is 4 million vegetable seedlings.

- In Azemour the production facilities will be maximized. The mixing and sowing equipment in Azemour will be used in production activities for both the Azemour and the Agadir regions. Production target for Azemour for Year 5 is 4 million seedlings.

Potted Plants/Rooted Cuttings. A mother plantation for the potted plants/cuttings was completed in a 400 m^2 greenhouse. There are 20 different species of potted plants. The heated propagation system has been overhauled and is in excellent working condition. A mist system will be introduced and electricity will be supplied by a new generator.

This facility will be used only for rooting of potted plant cuttings, not for production of final products. The number of rooted cuttings to be produced in 1996 will be a function of the marketing effort which is described later.

"Green" Rose Seedling. The "green" rose seedling is a new method for propagation of rose seedlings which reduces production time from 12 to 3 months. Correspondingly production costs are significantly reduced. Following a marketing study for rose seedlings which demonstrates sufficient demand, the facility will start production of rose seedlings.

Hardening of Tissue Culture Propagated Palm Trees. Virus diseases are affecting many date-palm plantations in south Morocco. The possibility of hardening of micropropagated seedlings in Azemour will be evaluated, both from the technical and economical view points.

3. RESEARCH

Research is divided into three components: Adaptive research, cooperative research, and collaborative research. Adaptive research is carried out at the Azemour site, cooperative research in Israel, and collaborative research in both Morocco and Israel.

Adaptive Research. Five adaptive research activities will be carried out at Azemour.

- Effect of the growth regulator (paclubutrazol) on growth suppression. The growth regulator "paclubutrazol" is a very effective plant dwarfing agent. This substance can be used to prevent the fast growth of vegetable seedlings in the nursery. This will result in savings for the nursery since seedlings which were not shipped on time will be able to stay in good conditions for additional weeks.

  The Project's Israeli scientific team has experimented in Years 3 and 4 with paclubutrazol. The recommendations from their research results will be tested at the Azemour nursery to produce final recommendations.

- Testing of indeterminate nematode resistant tomato cultivars. All the vegetable production areas around Azemour and at Agadir are infested with nematodes. For this reason, growers must sterilize the soils annually with nematocides and other substances. These chemical treatments are both very expensive and they contaminate the soil, ground and surface waters, and the atmosphere. The introduction of

nematode resistant tomato cultivars should result in significant production cost savings and also it will ensure the ecological sustainability of the industry.

The cultivar "Daniela" which was developed in Israel is occupying more than 90% of protected tomato production in Morocco. At the Azemour site, the nematode resistant and nematode tolerant new cultivars of Daniela germ plasm will be tested. The successful cultivars will be propagated at the nursery for commercial products.

- Testing of determinate open field nematode resistant tomatoes (part of a cooperative research program). The determinate open field tomatoes are being produced in Israel and are being tested at Azemour. Selection of most promising lines will be carried out by the Israeli plant breeder in cooperation with members of the Moroccan Technical Committee.

- Production of Melaleuca for decorative branches. The exports of ornamentals from Morocco is limited to mainly two items, roses and carnations. Melaleucas are hardy shrubs or trees from Australia. Many Melaleuca species have very decorative branches which can be used as "greens" for floral decoration. Melaleucas are grown outdoors. Both investment and production costs are low. The branches can be exported by trucks so that transportation costs are also relatively low. Two species of melaleucas (M.mesophylla and M.Sp.) which were planted in Azemour are also salt tolerant and are irrigated with local saline water.

  To date the two Melaleuca species have done extremely well. In 1995-97, export trials will be conducted to various markets in Europe and Canada. Based on these results, an economic analysis will be made and if positive, the nursery will commence production of Melaleuca seedlings with the intention of commercialization of this new product.

- Asparagus with saline water. The objectives of this trial are: a) to demonstrate the use of local saline water on a self tolerant crop; b) to introduce to Morocco the high yielding and high quality asparagus hybrids of California; c) to explore the possibility of early season exports of asparagus to the European and Canadian markets. Four varieties are being tested.

  First harvest will start in February 1996. In 1997, we will conduct export trials to the European and Canadian markets.

- Artichokes with saline water. The objectives of this trial are: a) To demonstrate the use of local saline water on a salt tolerant crop; b) to introduce to Morocco the practice of sparse application of givverlic acid to reduce off-season production of artichokes. Trials will continue in 1996 and 1997.

- Raspberry—a new export crop for Morocco. Raspberry can become a very attractive export item for Moroccan agriculture: a) In the mild climate of Morocco's coastal

area, raspberries mature long before they are produced in Europe and can, therefore, be sold at relatively high prices; b) this is a labor intensive crop which is advantageous for Morocco with its cost-effective labor; and c) both investments and production costs are relatively low. Thus, it can become an attractive crop for the small Moroccan farmers.

The raspberry trials in Azemour with its five cultivars will continue in 1996 and 1997. Yield and quality will be assessed and export trials will be carried out.

Research and Development in Israel. All research projects in Israel will continue into the final year, except for the tissue propagation program for Eucalyptus. This research program is no longer relevant to the project, because of the decision to discontinue the construction of the tissue culture laboratory in Morocco. A new research program on raspberry chilling is suggested instead.

The following are descriptions of the research projects to be conducted in Israel during the fifth year of the program:

- Evaluation of chilling of raspberry roots on flowering induction and yield. Raspberries are normally produced in regions where winter temperatures are lower than those experienced in Morocco's or Israel's coastal areas. Most cultivars require some winter chilling to induce flowering.

  The research program set for Year 5 will investigate the effect of artificial chilling of raspberry roots for flowering and yield. The effect of chilling will be compared with non-chilled controls. The trials will be carried out at the laboratories of the Ben Gurion University in Beer Sheva and at a research site in the Negev coastal area.

- Breeding of nematode resistant open field tomatoes. The program in Israel involves the production of new hybrid lines which are being tested at the Azemour site. It is expected that by the end of the project at least two new open field nematode resistant cultivars will be introduced to Morocco.

- Effect of growth suppression by paclubutrazol on early growth of greenhouse tomatoes. Trials carried out to date demonstrated the effectiveness of growth suppression by paclubutrazol on extending the period that tomato seedlings stay in the nursery. This effect enables the nursery to keep the seedlings for an additional ten days for customers that did not prepare their fields on time. In both Morocco and Israel, tomatoes are planted in greenhouses from late August onwards. Greenhouse ambient air temperatures in August and September are very high. Tomato plants respond to this temperature by excessive elongation rates of the internodes. Growth suppression at this first stage may also be advantageous. A series of trials will be carried out to assess the effect of growth suppression of tomatoes during the post planting period on growth, flowering, and yield of tomatoes.

- Verticordia—a new floriculture product. Verticordia is endemic to Australia. It includes many shrub species with outstanding floral qualities. The shrubs which are planted outdoors produce high quality and attractive flowering branches. This is a totally new product with great potential for the horticultural industry of both Morocco and Israel.

  To date, numerous Verticordia species were selected, techniques of vegetable propagation were perfected and nutritional requirements have been identified. In Year 5 of the program, we will concentrate on the management and floral aspects, growth media, irrigation processing, yield, post harvest, and recovery after harvest.

Collaborative Research. When the project started in 1992, the program could not initiate collaborative research programs. In 1994, the first collaborative program between Morocco and Israel was initiated and continued in 1995. In 1995 a second collaborative program was initiated. The two new collaborative programs are:

- The domestication of the Truffle *Terfezia leouis*. This collaborative program, which is being carried out by Dr. Varda Zur from the Ben Gurion University and Dr. Mohamed Achouri of the Hassan II Institute in Agadir, is achieving domestication of the Moroccan truffle *Terfezia leouis*. This quite unique trial produces symbionts with annual plants. Therefore, we can obtain fruiting bodies within a few months from inoculation.

  There is very little knowledge on *T. leouis*, its host plants, the environmental requirements for inoculation growth and fruiting body, and general variation of *T. leouis* in relation to rates of fruiting bodies formation.

  The research in Israel concentrates on understanding the two basic relations between the fungus and its hosts, and in identifying two mechanisms leading to fruiting bodies formation. The research in Morocco will concentrate on the identification of the range of host plants, selection of productive gene types, and study the optimal environmental requirements for *Terfezia* inoculation and growth. In Year 5 of the project, Dr. Achouri will work together with Dr. Kagan-Zur at Ben Gurion University of the Negev on this project.

- The ecology and domestication potential of the Argan tree (*Argania spihosa*). This collaborative work between Dr. Fauzia Aameur of the University Ibn Zohr and Dr. A. Nerd of the Ben Gurion University started in 1995 and will continue into project Year 5.

  Argan grows in Morocco. It is a draught tolerant tree with multipurpose uses. The Argani oil which is extracted from its seed is a high quality culinary oil that fetches high prices. This oil is also used in the cosmetics industry. The branches and stems are used for firewood.

In Morocco, the population of Argan trees is shrinking, due to over exploitation. The research objectives in Morocco are related to finding avenues to stop over exploitation of Argan and to restore the Argan tree.

The research objectives in Israel are to demonstrate the uses of Argan and to develop the argan into a commercial crop for oil production.

4. MARKETING

Marketing activities will be intensified in project Year 5. In project Year 4 an Amaris office opened at the Eit Maloul Village near Agadir. This village is the center of trade for protected agriculture activities in the Agadir region. The office staff includes two marketing officers and a secretary.

Marketing of the Amaris products will be carried out in a variety of ways:

- One to one visitations to producers.
- Advertisement in local papers and on road sides.
- Organization of field days and tours of the Azemour and Agadir R&D production sites.
- Introduction of new attractive products (high quality transplant tomato cultivars, new nematode resistant tomato cultivars, etc.).
- In addition, the Amaris office will initiate new marketing efforts (see Outreach and Cooperative Activities).

At the Azemour site, marketing will also include:

- Response of the European and Canadian markets to Melaleuca branches.
- Marketing of early season asparagus and raspberries in Morocco and Europe.
- Marketing of out-of-season artichokes.
- Marketing of root cuttings of potted plants.
- Marketing of "green" rose seedlings.

Following the yield determination for the above crops and the marketing studies, an economical analyses will be carried out for each product to determine their profitability. These analyses will be presented to potential customers as a part of the marketing drive.

5. OUTREACH AND COOPERATIVE ACTIVITIES

Outreach and cooperative activities will be intensified during the project's last year. Overall emphasis will be given to cooperation between the project and the Horticulture Center of the Hassan II Institute at Agadir. The Center plays a central role in the development of horticulture in the Agadir region, and it has an enthusiastic young scientific staff which were trained in the U.S.

- Hassan II representative of the Technical Committee. Dr. Mbarek Fatmi, director for the Plant Protection Department of the Hassan II Institute of Agriculture and Veterinary Sciences in Agadir, has joined the joint Technical Committee. Dr. Fatmi adds to the Technical Committee with his expertise on plant protection; knowledge of the farming community; and most important, he serves as a direct link between the project and his institute.

- Joint Services. The members of the project's Technical Committee will, during each annual meeting, organize joint seminars with Hassan III. These seminars will be sponsored and organized by Magreb Agriculture and its Amaris nurseries.

  The first seminar is schedules for January 16, 1996. Seminar participants will be growers from the region. They will visit the Amaris nursery during the seminar.

- Joint course in greenhouse management. A joint 3-week course on greenhouse management is planned for spring 1996. The course will be developed and executed by the Amaris project, the Israeli Mashav (Department of International Cooperation), and the Hassan II Institute of Agadir.

- Irrigation and fertilization management course held in Israel. Twenty technical experts from the private sector will be organized through the Amaris nursery. This course will be developed jointly by the project's Technical Committee and the CINADCO (Center for International Agriculture Development Cooperation) organization. This course will last one month.

- Organized visit to Agritech. The Amaris nursery will organize a group of farmers from the Agadir region to visit the Israeli International Exhibition of Agriculture Technologies—"Agritech," which will be held during May 12-16, 1996.

  The group will also visit production sites with relevance to their activities.

- Field days. Periodically, the project will organize field days to demonstrate findings of the adaptive research activities at the Azemour site to the farmers.

- Extension. Professional advise and follow-up visits will be arranged for the growers who have purchased seedlings from the Armaris nursery.

CHANGES IN PERSONNEL

Israeli Technical Advisor
Mr. Itzhak Ayalon, Technical Advisor at Amaris Nurseries, ended his employment with the project on January 31, 1995. Mr. Gadi Regev was hired as the new Israeli Technical Advisor on February 1, 1995. Mr. Gadi Regev was replaced by Mr. Nissim Srousi on July 1, 1995.

Moroccan Farm Manager
Mr. Omar Mounaz was hired to manage the site activities at Amaris Nurseries beginning February 1, 1995.

Project Assistant
Ms. Judith Archuleta, 3/4 time project assistant for the San Diego State University Foundation office began employment with the project on July 24, 1995.

MEETINGS AND COLLABORATIVE ACTIVITIES

The attached provides information on meetings and other collaborative activities accomplished during this reporting period: October 1, 1994 - March 31, 1995.

MEETINGS

Steering Committee and Related Meetings and Field Trips October 1994

Meeting

Members of the Steering Committee and other participating individuals from the US, Morocco and Israel met in Morocco on October 11-12, 1994. The purpose of this trip was to attend the Steering Committee Meeting as well as to visit the project sites in Azemour.

Steering Committee Members present at the meetings were Mr. Driss Lahlou from Morocco (Mr. Alami was absent); Dr. Samuel Pohoryles, Dr. Dov Pasternak and Mr. Itzhak Peretz from Israel; Mr. Harry Albers, Ms. Frea Sladek and Dr. Ronald Hopkins from the United States. Others in attendance were Professor Lehaim Naggan, Vice-President and Dean of Research and Development, Ben Gurion University of the Negev in Israel.; Dr. Bonnie Stewart, U.S. Project Director; Dr. Mohamed El-Assal, Coordinator for the Maryut and CALAR Projects.

Field Trips

Members of the Steering Committee visited Amaris nurseries at the project site in Azemour prior to the meeting. Several dignitaries joined the group for a tour of the farm followed by informal discussion. Guests included:

U.S. Ambassador and Mrs. Marc Ginsberg
Mr. Michael Farbman, USAID Mission Director
Mr. Alan Hurdus, USAID Agricultural Officer

The visitors were very impressed with project accomplishments to date. The Ambassador was keenly aware of the importance of regional cooperation programs. All three visitors indicated that they will be watching closely as the project continues. They are particularly concerned about the long-term progress of the program and hope that the farm becomes self-sustaining by the end of the project if not sooner. With the successful implementation of this program, they would like to see similar projects supported in the future.

Technical Committee Meeting and Field Trips
August 1995

Meeting

Members of the Technical Committee and other participating individuals from the US, Morocco and Israel met in Morocco on August 23-25, 1995. The purpose of this trip was to attend the Technical Committee Meeting as well as to review activities at the project sites in Azemour and Agadir.

Technical Committee Members present at the meetings were Mr. Hammoutou El-Mekki, Dr. Mbarek Fatmi, and Mr. Allal Chibane from Morocco; Dr. Dov Pasternak and Mr. Eliezer Spiegel from Israel; Dr. Richard Jones and Dr. Michael Reid from the United States. Others in attendance were Mr. Driss Lahlou, Mr. Karim Lahlou, Mr. Omar Mounaz, Mr. Nissim Sroussi and Dr. Bonnie Stewart.

Dr. Mbarek Fatmi, Hassan II Institute in Agadir, was a new member on the Moroccan Technical Committee team.

The Technical Committee members reviewed the progress at the project sites and made recommendations. Work plans were developed for each site.

Field Trips

Members of the Technical Committee visited Amaris nurseries at the project site in Azemour and the project site in Agadir prior to the meeting.

TRAVEL COSTS

The attached summaries details the costs, dates, names, origins and destinations for the project related travel that took place during this report period: October 1, 1994-September 30, 1995.

TRAVEL COST SUMMARY: October 1, 1994-September 30, 1995 (General)

Purpose: Other Project related travel, for technical evaluation, procurement of equipment and consultations

NAME	DATE	PURPOSE	ORGIN/ DESTIN.	DESCRIPTION	EXPENSES
Mr. I. Ayalon	Nov. 8-23	Collect bids, project meetings	Casablanca/ Tel Aviv/ Casablanca	Transportation (Air/Ground)	$1,932
				Hotel/Lodging	$0
				Per Diem	$0
				Total Mr. Ayalon	**$1,932**
Mr. A. Hassan	Oct. 5 - Dec. 5	Attend training course in irrigation technology	Casablanca/ Tel Aviv/ Casablanca	Transportation (Air/Ground)	$1,318
				Hotel/Lodging	$0
				Per Diem	$0
				Total Mr. Hassan	**$1,318**
Dr. D. Pasternak	Dec. 12-15	Management meeting, conduct interviews	Beer-Sheva/ Casablanca/ Beer-Sheva	Transportation (Air/Ground)	$1,062
				Hotel/Lodging	$139
				Per Diem	$225
				Total Dr. Pasternak	**$1,426**
Dr. D. Pasternak	Jan. 5-8	Project evaluation, meet with all of Israeli project members	Beer-Sheva/ Tel Aviv/ Beer-Sheva	Transportation (Air/Ground)	$0
				Hotel/Lodging	$106
				Per Diem	$268
				Mis. hosting, meeting expen.	$386
				Total Dr. Pasternak	**$760**
Dr. B. Stewart	Dec. 7-18	Management meeting, interviews, AID brief, meet with evaluation team	San Diego/ Wash.D.C./ Casa/SD/ Davis/SD	Transportation (Air/Ground)	$1,543
				Hotel/Lodging	$502
				Per Diem	$687
				Misc. phone, fax, film	$239
				Total Dr. Stewart	**$2,971**
Dr. S. Pohoryles	Jan. 18-19	Budget review and resolution	Tel Aviv/ Paris/TA	Transportation (Air/Ground)	$1,627
				Hotel/Lodging	$280
				Per Diem	$239
				Total Dr. Pohoryles	**$2,146**

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TRAVEL COST SUMMARY: October 1, 1994-September 30, 1995 (General)

NAME	DATE	PURPOSE	ORGIN/ DESTIN.	DESCRIPTION	EXPENSES
Mr. D. Lahlou	Jan. 18-19	Budget review and resolution	Casablanca/ Paris/Casa	Transportation (Air/Ground)	$0
				Hotel/Lodging	$280
				Per Diem	$314
				Total Mr. Lahlou	**$594**
Mr. G. Regev	Jan. 5-31	Consultation and project review	Beer-Sheva/ Casablanca/ Beer-Sheva	Transportation (Air/Ground)	$1,243
				Hotel/Lodging	$1,785
				Phone	$50
				Total Mr. Regev	**$3,078**
Mr. G. Regev	Feb. 20-31-May	Project technical advise	Beer-Sheva/ Casablanca/ Beer-Sheva	Transportation (Air/Ground)	$2,111
				Hotel/Lodging	$4,000
				Per Diem	$0
				Misc. phone, fax, visas	$348
				Total Mr. Regev	**$6,459**
Dr. B. Stewart	Jan. 4-12	Project evaluation review in Israel	San Diego/ Tel Aviv/SD	Transportation (Air/Ground)	$1,558
				Hotel/Lodging	$626
				Per Diem	$542
				Misc. phone, fax, film	$120
				Total Dr. Stewart	**$2,846**
Dr. B. Stewart	Jan. 23 - Feb. 2	Project evaluation review in Morocco	San Diego/ Casablanca/ San Diego	Transportation (Air/Ground)	$1,396
				Hotel/Lodging	$988
				Per Diem	$663
				Misc. phone, fax, film	$629
				Total Dr. Stewart	**$3,675**
Dr. B. Stewart	Mar 16-23	Management review and planning	San Diego/ Casablanca/ San Diego	Transportation (Air/Ground)	$1,822
				Hotel/Lodging	$669
				Per Diem	$388
				Misc. phone/fax, market info	$180
				Total Dr. Stewart	**$3,059**

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TRAVEL COST SUMMARY: October 1, 1994-September 30, 1995 (General)

NAME	DATE	PURPOSE	ORGIN/ DESTIN.	DESCRIPTION	EXPENSES
Dr. D. Pasternak	Mar 17-20	Management review and planning	Beer-Sheva/ Casablanca/ Beer-Sheva	Transportation (Air/Ground)	$1,527
				Hotel/Lodging	$294
				Per Diem	$208
				Total Dr. Pasternak	**$2,029**
Dr. V. Tsur	Mar 5-13	Collaboration on Truffles research project	Beer-Sheva/ Casablanca/ Beer-Sheva	Transportation (Air/Ground)	$1,184
				Hotel/Lodging	$404
				Per Diem	$486
				Materials, host Dr. Achouri	$245
				Total Dr. Varda Tsur	**$2,318**
Dr. A. Nerd	Apr 25 - 9-May	Argan Tree Research	Tel Aviv/ Casablanca/ Agadir/ Casablanca/ Rome/ Tel Aviv	Transportation (Air)	$981
				Hotel/Lodging	1019.72
				Per Diem	$710
				Car Rental/Fuel	$1,258
				Misc. Passport	$107
				Total Dr. Avinoam Nerd	**$4,075**
Dr. B. Stewart	May 21-27	Management review and planning	San Diego/ Wash DC/ Casablanca/ San Diego	Transportation (Air/Ground)	$1,687
				Hotel/Lodging	$549
				Per Diem	$449
				Misc. phone/fax, market info	$21
				Total Dr. Stewart	**$2,705**
Mr. Y. Ben-Dov	May 7-14	Technical advise for ornamentals/melaleuca	Tel Aviv/ Casablanca Tel Aviv	Transportation (Air/Ground)	$1,014
				Hotel/Lodging	$516
				Per Diem	$435
				Misc. currency exchange	$55
				Total Mr. Ben-Dov	**$2,020**
Mr. G. Regev	Jun 1-30	Project technical advisor	Tel Aviv/ Casablanca/ Tel Aviv	Transportation (Air/Ground)	$1,094
				Hotel/lodging	$1,000
				Per Diem	
				Misc. (bk charges, phone, Visa)	$174
				Total Mr. Regev	**$2,268**

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TRAVEL COST SUMMARY: October 1, 1994-September 30, 1995 (General)

NAME	DATE	PURPOSE	ORGIN/ DESTIN.	DESCRIPTION	EXPENSES
Dr. D. Pasternak	Jun 25-28	Technical review	Tel Aviv/ Agadir/Casa Paris/Tel Aviv	Transportation (Air/Ground)	$1,903
				Hotel/Lodging	$230
				Per Diem	$267
				Misc. (phone)	$13
				Total Dr. Pasternak	**$2,412**
Mr. N. Sroussi	Jun 25-30	Project technical advisor	Tel Aviv/ Agadir/Casa Paris/Tel Aviv	Transportation (Air/Ground)	$1,068
				Hotel/Lodging	$577
				Per Diem	$495
				Misc.	$0
				Total Mr. Sroussi	**$2,140**
Mr. N. Sroussi	July 1-31	Project technical advisor	Agadir	Transportation (Air/Ground)	$935
				Hotel/Lodging	$1,000
				Misc. (insurance/visa)	$220
				Total Mr. Sroussi	**$2,154**
Mr. N. Sroussi	Aug 1-31	Project technical advisor	Agadir	Transportation (Air/Ground)	$0
				Hotel/Lodging	$1,000
				Misc.	$0
				Total Mr. Sroussi	**$1,000**
Mr. N. Sroussi	Sept 1-30	Project technical advisor	Agadir	Transportation (Air/Ground)	$0
				Hotel/Lodging	$1,000
				Misc.	$0
				Total Mr. Sroussi	**$1,000**
Mr. N. Sroussi	Oct 1-31	Project Technical advisor	Agadir/ Tel Aviv/ Adadir	Transportation (Air/Ground)	$1,129
				Hotel/Lodging	$1,500
				Misc. project purchases	$125
				Total Mr. Sroussi	**$2,754**
Total Travel Expenses for Itemized Project Purposes				*Total*	**$54,294**

TRAVEL COST SUMMARY: October 1, 1994 - September 30, 1995 (Steering Committee)

Purpose: Moroccan, Israeli, and U.S. Participants attended the October 11-12, 1994 Steering Committee Meeting in Casablanca. The project site in Azemour was visited by the participants on October 11, 1994.

NAME	DATE	PURPOSE	ORGIN/ DESTIN.	DESCRIPTION	EXPENSES
U.S. PARTICIPANT					
Dr. B. Stewart	Oct 7-14	Steering Cmt Mtng	San Diego/ Casablanca /San Diego	Transportation (Air/Ground)	$1,645
				Hotel/Lodging	$842
				Per Diem	$424
				Total Dr. Stewart	**$2,911**
Mr. H. Albers	Oct 9-14	Steering Cmt Mtng	San Diego/ Casablanca /San Diego	Transportation (Air/Ground)	$1,661
				Hotel/Lodging	$867
				Per Diem	$320
				Total Mr. Albers	**$2,848**
Ms. F. Sladek	Oct 9-14	Steering Cmt Mtng	San Diego/ Casablanca /San Diego	Transportation (Air/Ground)	$1,658
				Hotel/Lodging	$635
				Per Diem	$347
				Total Ms. Sladek	**$2,640**
Dr. R. Hopkins	Oct 9-14	Steering Cmt Mtng	San Diego/ Casablanca /San Diego	Transportation (Air/Ground)	$1,623
				Hotel/Lodgin	$639
				Per Diem	$320
				Total Dr. Hopkins	**$2,583**
ISRAELI PARTICIPANTS					
Dr. D. Pasternak	Oct 9-13	Steering Cmt Mtng	Beer-Sheva/ Casablanca /Beer-Sheva	Transportation (Air/Ground)	$1,766
				Hotel/Lodgin	$423
				Per Diem	$276
				Total Dr. Pasternak	**$2,466**
Mr. I. Peretz	Oct 10-15	Steering Cmt Mtng	Tel Aviv/ Casablanca /Tel Aviv	Transportation (Air/Ground)	$1,064
				Hotel/Lodgin	$295
				Per Diem	$257
				Total Mr. Peretz	**$1,616**

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TRAVEL COST SUMMARY: October 1, 1994 - September 30, 1995 (Steering Committee)

NAME	DATE	PURPOSE	ORGIN/ DESTIN.	DESCRIPTION	EXPENSES
Dr. S. Pohoryles	Oct 9-14	Steering Cmt Mtng	Tel Aviv/ Casablanca /Tel Aviv	Transportation (Air/Ground)	$1,366
				Hotel/Lodgin	$404
				Per Diem	$291
				Total Dr. Pohoryles	**$2,061**
Dr. L. Naggan	Oct 9-14	Steering Cmt Mtng	Beer-Sheva /Casablanca /Beer-Sheva	Transportation (Air/Ground)	$1,104
				Hotel/Lodgin	$430
				Per Diem	$294
				Total Mr. Naggan	**$1,828**
MISCELLANEOUS BUSINESS EXPENSE					
Steering Committee Members				Misc. Meeting/Trip Expenses (Film, film developing, telephone, and meeting room/luncheon)	$835
				Total Miscellaneous Expenses	**$835**
TOTAL EXPENSES FOR OCTOBER 1994 STEERING COMMITTEE MEETING					**$19,787**

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TRAVEL COST SUMMARY: October 1, 1994 - September 30, 1995 (Technical Committee)

Purpose: Moroccan, Israeli and U.S. participants attended the August 21-25, 1994 Technical Committee Meeting in Casablanca. The project site in Agadir was visited by the participants on August 23, 1995.

NAME	DATE	PURPOSE	ORGIN/ DESTIN.	DESCRIPTION	EXPENSES
U.S. PARTICIPANT					
Dr. B. Stewart	Aug 21-27	Tech Commt Mtng	San Diego/	Transportation (Air/Ground)	$2,184
			Brussels/	Hotel/Lodging	$566
			Casa/Aga/	Per Diem	$443
			Casa/Paris	Misc.	$22
			Dallas/San	*Total Dr. Stewart*	**$3,215**
ISRAELI PARTICIPANTS					
Dr. D. Pasternak	Aug 21-27	Tech Commt Mtng	Tel Aviv/	Transportation (Air/Ground)	$1,804
			Casablanca/	Hotel/Lodging	$566
			Agadir/Casa	Per Diem	$518
			Tel Aviv	Misc phone, mtng exp	$54
				Total Dr. Dov Pasternak	**$2,943**
Mr. E. Spiegel	Aug 21-27	Tech Commt Mtng	Tel Aviv/	Transportation (Air/Ground)	$974
			Casablanca/	Hotel/Lodging	$566
			Agadir/	Per Diem	$548
			Tel Aviv	Misc.	$0
				Total Mr. E. Spiegel	**$2,088**
Mr. U. Drori	Aug 21-25	Tech Commt Mtng	Tel Aviv/	Transportation (Air/Ground)	$1,504
			Casa/Agadir	Hotel/Lodging	$339
			Tel Aviv	Per Diem	$208
				Misc.	$0
				Total Mr. Uri Drori	**$2,051**
Moroccan Participants					
Dr. Michael Reid	Aug 21-27	Tech Commt Mtng	Sacramento/	Transportation (Air/Ground)	$2,899
			Agadir/Casa	Hotel/Lodging	$479
			Malaga/San	Per Diem	$357
			Francisco	Misc. phone	$37
				Total Dr. Michael Reid	**$3,771**

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TRAVEL COST SUMMARY: October 1, 1994 - September 30, 1995 (Technical Committee)

NAME	DATE	PURPOSE	ORGIN/ DESTIN.	DESCRIPTION	EXPENSES
Mr. M. Fatmi	Aug 23-25	Tech Commt Mtng	Rabat/Aga/ Casablanca	Transportation (Air/Ground)	$0
				Hotel/Lodging	$226
				Per Diem	$195
				Misc.	$0
				Total Mr. M. Fatmi	**$421**
Mr. H. El-Mekki	Aug 23-25	Tech Commt Mtng	Rabat/Aga/ Casablanca	Transportation (Air/Ground)	$0
				Hotel/Lodging	$226
				Per Diem	$195
				Misc.	$0
				Total Mr. Hammoutou El -Mekki	**$421**
Mr. A. Chibane	Aug 23-25	Tech Commt Mtng	Rabat/Aga/ Casablanca	Transportation (Air/Ground)	$0
				Hotel/Lodging	$226
				Per Diem	$195
				Misc.	$0
				Total Mr. Allal Chibane	**$421**
Dr. R. Jones	Aug 21-27	Tech Commt Mtng	Sacramento/ Casablanca/ Agadir/ Sacramento	Transportation (Air/Ground)	$1,457
				Hotel/Lodging	$566
				Per Diem	$0
				Misc.	$0
				Total Dr. Richard Jones	**$2,022**
Ms. N. Chouie	23-Aug	Tech Commt Mtng	Casablanca/ Agadir/Casa	Transportation (Air)	$154
				Total Ms. N. Chouie	**$154**
Miscellaneous Technical Committee Meeting Expense				*Field trip to Agadir farm*	
	Aug21-27			Bus transportation to airport	$119
				Airfare to/from Agadir	$2,153
				Bus transportaion in Agadir	$631
				Luncheon in Agadir	$167
				Misc. Meeting Expenses (film, film developing, phone, fax, meeting rm/breaks/audio/video	$1,156
				Total Misc Meeting Expense	**$4,226**
TOTAL EXPENSES FOR AUGUST 1995 TECHNICAL COMMITTEE MEETING					**$21,733**

PROCUREMENT

Attached is an updated list of equipment, materials and supplies procured for the project.

EQUIPMENT FOR AZEMOUR

	Maghreb Agriculture						
	List of Materlials and Supplies Actual vs. Planning		Actual	Actual	Actual	Actual	
	July 1, 1992 - September 30, 1994		Purchases	Purchases	Purchases	Purchases	Source
		Approved	1st & 2nd Year	3rd Year	4th Year	4th Year	Origin
					Azemour	Agadir	
1	**Infrastructure & Machinery**						
	a. Meterological Station	$20,000		$6,587			USA
	b. Electrical Generator	$18,000					
	c. 110 HP Tractor	$25,000	$28,351				M/USA
	d. 60 HP Tractor	$15,000					
	e. Subsoiler	$3,000	$3,230				M
	f. Rotovator	$5,000	$1,170				M
	g. Disk Harow	$2,000	$2,107				M
	h. Riverside Triple Head Plough	$7,000					
	i. Boom Sprayer 500 liter stainless	$4,000	$3,564				M
	j. Fertilizer Spreader	$1,000					
	k. Fogger			$5,500			M
	l. Organic Spreader	$4,000					
*	m. Water Development (not in original approved List)		$1,752	$27,713			M
	Sub Total	**$104,000**	**$40,174**	**$39,800**	**$0**	**$0**	
2	**2000 m2 Transplant Nursery**						
	a. 2000m2 Steel Structure (3000m2)	$15,000	$20,470	$31,000	$4,048	$23,268	ISR/M
	b. Plastic Cover IR AF	$12,000				$2,730	M
	c. Concrete Paths & Works	$10,000		$6,152			M
	d. Benches & Trays	$68,000	$22,422	$38,952		$41,104	ISR/M
	e. Heating system	$25,000	$16,050				ISR
	f. Cooling & Ventilation	$22,000		$3,100			ISR
	g. Irrigation & Fertilization	$25,000	$10,000	$12,432		$7,371	ISR/M
	h. Electrical Works	$8,000		$9,549			M
	i. Preparation Area & Germination Room	$10,000		$64,752			M
	j. Automatic Seeding System	$14,000	$17,550	$9,320			ISR
	k. General Supplies			$4,718			M
	Sub Total	**$209,000**	**$86,492**	**$179,975**	**$4,048**	**$74,473**	
3	**10,000 m2 Open Field**						
	a. Initial Field Treatment, Drains, Pipe	$20,000		$43,326			M
	b. Drip Irrigation System	$120,000	$38,187	$31,944	$2,125		M/ISR
	c. Automation & Main Head	$25,000					
	Sub Total	**$165,000**	**$38,187**	**$75,270**	**$2,125**	**$0**	
4	**1,000 m2 Pot Plant Nursery**						
	a. Galvanized Steel Structure	$8,000	$18,920				ISR
	b. Cover	$10,000					
	c. Benches & Trays	$50,000	$11,658				ISR
	d. Concrete Path & Works	$10,000					
	e. Root Heating System	$14,000	$2,100		$2,374		ISR
	f. Space Heating System	$10,000					
	g. Cooling System	$15,000					
	h. Thermal Screen	$8,000		$372			M
	i. Irrigation & Fertilization	$10,000	$7,000		$291		ISR
	Sub Total	**$135,000**	**$39,678**	**$372**	**$2,665**	**$0**	
5	**Micropropagation Laboratory**						
	a. Construction	$160,000					
	b. Air Conditioning & Positive Pressure Sy	$65,000					
	c. Light, Electricity, Gas and Vaccuum Sy	$20,000					
	d. Internal Furniture	$20,000					
	e. Equipment including five hoods, autocal	$35,000					
	f. Hardening nursery (included in construction budget)		$18,920				ISR
	Sub Total	**$300,000**	**$18,920**	**$0**	**$0**	**$0**	

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EQUIPMENT FOR AZEMOUR

	Maghreb Agriculture						
6	*List of Materlials and Supplies Actual vs. Planning*		Actual	Actual	Actual	Actual	
			Purchases	Purchases	Purchases	Purchases	Source
		Approved	1st & 2nd Year	3rd Year	4th Year	4th Year	Origin
					Azemour	Agadir	
	c. Mixing Machine	$6,000		$31,630			ISR
	d. Steam System	$10,000					
	e. Packing System	$3,000					
	Sub Total	**$19,000**	**$0**	**$31,630**	**$0**	**$0**	
7	**Fertilizer & Chemicals**						
	a. Super Phosphate - 60 tons	$5,000					
	b. Ammonium Sulfate - 60 tons	$5,000					
	c. Potassium Chloride - 60 tons	$3,000					
	d. Compounded Fertilizer - 20 tons	$10,000	$3,308	$8,367			M
	e. Organic Manure	$10,000	$13,904	$29,659			M
	Sub Total	**$33,000**	**$17,212**	**$38,026**	**$0**	**$0**	
8	**Nursery Supplies**						
	a. Seeds	$50,000	$4,070	$20,096			M,ISR,USA
	b. Plant Stock	$40,000		$11,677			M,ISR,USA
	c. Vermiculte	$10,000	$2,025	$1,620			M,ISR
	d. Peat	$10,000	$936	$3,527		$1,982	M
	Sub Total	**$110,000**	**$7,031**	**$36,920**	**$0**	**$1,982**	
9	**Office Equipment and Supplies**						
	a. Fax machine	$4,000	$1,003				USA
	b. Photocopier	$6,000					
	c. Desk tables	$2,000					
	d. Typewriter and general office equipmen	$4,000					
	e. Computer and software	$10,000	$4,567	$3,245			USA
	f. Office supplies	$2,000					
	Sub Total	**$28,000**	**$5,570**	**$3,245**	**$0**	**$0**	
10	**Other Supplies and Equipment**						
	a. Plastics	$10,000	$26,394	$27,032	$631		M,ISR
	b. Benches	$10,000		$2,932			M
	c. Water Chemicals and Fuel	$15,000	$26,060	$38,502			M
	d. Hoods	$10,000					
	e. Growth Chamber	$30,000					
	f. High Resolution Microscope	$50,000					
	g. Tensiometer (not on original approved list)		$360				M
	h. General supplies		$4,589	$21,219			M
	i. Maintenance		$7,493	$19,618			M
	Sub Total	**$125,000**	**$64,896**	**$109,303**	**$631**	**$0**	
	Grand Totals	**$1,228,000**	**$318,160**	**$514,541**	**$9,469**	**$76,455**	
	Total Actual Expenditures Year 1 & 2	**$918,625**					
	Total Approved minus Total Expenditures	**$309,[illegible]75**					
*	Water development costs were covered by project revenue.						12/8/95

PUBLICATIONS SUBMITTED TO USAID

The following Technical Reports have been submitted to USAID, as requested by the Moroccan Cooperative Agricultural Development Project grant.

Technical Reports Required by Grant	*Date Submitted*
• **Quarterly Technical Progress Report**	
October 1, 1992 - December 31, 1992	January 10, 1993
April 1, 1993 - June 30, 1993	July 10, 1993
October 1, 1993 - December 31, 1993	January 3, 1994
April 1, 1994 - June 30, 1994	July 10, 1994
October 1, 1994 - December 31, 1995	February 10, 1995
April 1, 1995 - June 30, 1995	July 10, 1995
• **Semi-Annual Technical Progress Report**	
July 1, 1992 - September 30, 1992	October 10, 1992
October 1, 1992 - March 31, 1993	April 10, 1993
October 1, 1993 - March 31, 1994	April 10, 1994
October 1, 1994 - March 31, 1995	April 10, 1995
• **Annual Technical Report**	
July 1, 1992 - September 30, 1992	October 10, 1992
October 1, 1992 - September 30, 1993	October 10, 1993
October 1, 1993 - September 30, 1994	November 10, 1994
October 1, 1994 - September 30, 1995	Current Report
• **Semi-Annual and Annual Technical Report**	
November 1992 Update	November 30, 1992

Financial Reports Required by Grant	
• **Quarterly Financial Report**	
July 1, 1992 - September 30, 1992	October 10, 1992
October 1, 1992 - December 31, 1992	January 10, 1993
January 1, 1993 - March 31, 1993	April 10, 1993
April 1, 1993 - June 30, 1993	July 10, 1993
July 1, 1993 - September 30, 1993	October 10, 1993
October 1, 1993 - December 31, 1993	January 10, 1994
January 1, 1994 - March 31, 1994	April 10, 1994
April 1, 1994 - June 30, 1994	July 10, 1994
July 1, 1994 - September 30, 1994	October 10, 1994

Financial Reports Required by Grant

- **Quarterly Financial Report -continued**

October 1, 1994 - December 31, 1994	January 10, 1995
January 1, 1995 - March 31, 1995	April 10, 1995
April 1, 1995 - June 30, 1995	July 10, 1995
July 1, 1995 - September 30, 1995	October 10, 1995

- **Projection of Funding Requirements Report**
  Fiscal Year July 1, 1993 - September 30, 1994
  Fiscal Year October 1, 1994 - March 31, 1995
  Fiscal Year April 1, 1995 - June 30, 1996

The "Morocco Report" Newsletters
Spring and Fall 1993
Spring and Fall 1994

PROBLEMS

PROBLEMS

Problems and Actions Taken to Address them

Speedling Inc. Infringement of Tradename and Plant Design

Speedling Inc. lawyers contacted project coordinators regarding the infringement of the trademarks name and plant design, ref. # 19468.145. The use of the term "speedling" and the logo used at Amaris was infringement on their tradename and plant design. The SDSU Foundation Legal Counsel contacted the lawyer for Speedling. The following plan of action was agreed upon: 1) a full disclaimer would be made in the next newsletter (Spring 1996); 2) a full disclaimer would be made in the next annual report that is submitted to all recipients of the newsletters (current report); 3) the use of the word "speedling" was discontinued immediately; 4) the signs at Azemour and Agadir have taken off the logo which was similar to the Speedling Inc. logo.

The following is the correction:

Correction

Previous issues of MOROCCO REPORT discussing activities and products of AMARIS Nurseries in Morocco and Israel have improperly used the registered trademarks SPEEDLING and SPEEDLING and Plant Design which are the subject of U.S. Trademark Registrations Nos. 967,911 and 1,099,084 and corresponding foreign registrations of Speedling, Inc. of Sun City, Florida. Such use was without permission of Speedling, Inc. and was a violation of the rights of Speedling, Inc. which is not affiliated with AMARIS Nurseries in any manner. This error is sincerely regretted.

Scope of Work Modification

The Technical Committee for the project met in June 1994. Based on information provided to the Committee, it was recommended that the project eliminate the plans for constructing a micro-propagation laboratory and instead concentrate on improving and maximizing transplant nursery production including expanding production and sales to the Agadir region. The Agadir region is the most rapidly growing agricultural area in Morocco and therefore has the greatest potential to utilize transplant materials. An important aspect of this expansion plan would be to increase efforts in marketing and sales.

Subsequently, the Steering Committee met in October 1994. They reviewed the recommendations of the Technical Committee as well as new information on the demand and supply in Morocco for micro-propagation facilities. The Steering Committee decided to reconsider plans for the laboratory.

Then in January 1995, the External Evaluation team for the Morocco program met in Casablanca. They reviewed the progress of the project to date and made recommendations for modifications to the scope of work for the program. The major recommendations were to eliminate construction of the micro propagation laboratory; to concentrate and expand transplant nursery production; and add a marketing and sales component to the work scope. Finally, the team emphasized continued efforts to expand training, extension and collaborative activities.

In response to the evaluation team's recommendation for a mid-term adjustment to the program, San Diego State University in collaboration with their Moroccan and Israeli partners, reviewed at length each suggestion and took these ideas into account in proposing a course of action for the current year. Specifically, the response stated that efforts would be targeted at expanding production and sales in the Agadir region. The June 1995 quarterly report provided an update to the progress of these action items. The following scope of work modification for the grant was submitted to USAID.

Transplant Nursery

The transplant nursery has been successful to date. The immediate goal is to improve the operational procedures and maximize transplant production activities. Maximizing production involves improving the production of transplant material in Azemour, developing markets for the transplants in Azemour and in Agadir regions, constructing and developing a greenhouse facility in Agadir to propagate the transplants, establishing a sales and information office in Agadir, developing clients and providing them product information and follow-up advise.

Marketing and Sales
Development of a market strategy is an essential part of expanding the transplant nursery production capacity as well as the ornamental nursery production. A marketing specialist will develop a plan, establish contacts for sales, provide support services to clients of Amaris Nurseries.

Micro propagation Laboratory
Construction of the laboratory will not be undertaken until the other activities of the program are realized and until the transplant nursery is running at full capacity. Once Amaris has demonstrated the ability to manage the current activities with greatest efficiency, the technical committee may consider construction of the micro propagation laboratory. If the decision is made to go forward with a micro-propagation laboratory, it is expected that the funds needed to construct the laboratory will primarily come from the income generated from the activities of the transplant nursery.

ACCOMPLISHMENTS IN REGIONAL COOPERATION

The attached provides information on collaborative activities accomplished during this reporting period: October 1, 1994 - September 30, 1995.

ACCOMPLISHMENTS IN REGIONAL COOPERATION

- **Ms. Frea Sladek,** SDSUF Associate General Manager, **Dr. Bonnie Stewart,** U.S. Project Director and **Dr. Dov Pasternak,** Technical Committee Chairman and Israeli Coordinator, traveled to Casablanca in December 1994 to interview candidates for the Moroccan farm manager position and to discuss strategies for the period of transition;
- **Mr. Itzhak Ayalon** traveled to Israel in November 1994 to discuss project technical details with Israeli Project Coordinator and Technical Committee Chairman;
- **Ms. Fatima Agdid** completed her three months extended training in Israel on October 31, 1994. She received instruction in pot-plant propagation;
- **Mr. Ainin Hassan**, a Moroccan agricultural technician, went to Israel for two-months training in irrigation in October - December 1994;
- **Mr. Gadi Regev** spent January 1995 in Morocco to work with Mr. Ayalon, Mr. Mounaz and Mr. Lahlou to facilitate the transition during the personnel changes;
- **Dr. Sam Pohoryles, Ms. Frea Sladek** and **Mr. Driss Lahlou** met in France in January 1995 in order to resolve misunderstandings regarding budget allocations;
- **Dr. Bonnie Stewart** and **Dr. Dov Pasternak** and all members of the Israeli project delegation met with the USAID mid-term evaluation team in Israel in January; **Dr. Stewart, Mr. Driss Lahlou** and the other Moroccan members of the project delegation met with the team again in Casablanca in January following the team's visit to Israel;
- **Dr. Pasternak, Dr. Stewart, Mr. Lahlou** and **Mr. W. Timothy Hushen**, SDSUF Director of Program Management, met in Morocco in March 1995 to prepare an action plan in response to the mid-term evaluation report recommendations; a follow-up visit was made in May 1995.
- **Dr. Varda Kagan-Tsur** met in Morocco with her collaborator, **Dr. Mohamed Achouri** at Hassan II Institute in Agadir, to collect truffles samples and to work out details of the research plan; it is proposed that Dr. Achouri travel to Israel for two months or more to work with Dr. Tsur;
- **Dr. Avinoam Nerd** traveled to Morocco in April 1995 to work on a research project on "Argan" with his Moroccan counterpart, **Dr. Fouzia Bani Aameur** at the University Ibnou Zohr in Agadir; it is proposed that Dr. Aameur travel to Israel for two months or more to work with Dr. Nerd;

- **Dr. Yossi Ben-Dov** traveled to Morocco in May 1995 to consult with project members on melaleuca and verticordia; Dr. Ben-Dov will work with **Mr. Hammoutou El-Mekki** on the research on melaleuca and verticordia; it is proposed that Mr. El-Mekki travel to Israel for two months or more to work with Dr. Ben-Dov;

- **Dr. Moshe Barr** will travel to Morocco, after a Moroccan counter-part is identified, in order to work on tomato breeding; initial contacts have been made at Hassan II Institute to identify a tomato breeder to participate in this collaborative research project;
- **Israel Ministry of Foreign Affairs** will offer in Morocco a mobile short course on agricultural topics; initial contacts have been made; the course will be offered once an official invitation has been extended by the Moroccan Ministry of Agriculture.
- **Dr. Dov Pasternak** and **Mr. Nissim Sroussi** traveled to Morocco in June to meet with **Mr. Lahlou**, the Moroccan Coordinator, to visit the project sites in Agadir and Azemour.

ACCRUED EXPENDITURES AND PROJECTION OF CASH NEEDS

15-Dec-95

MOROCCO PROJECT

	STATUS OF THE USE OF PRIOR YEAR FUNDS				ADDITIONAL FUNDS REQUIRED THROUGH 30 JUNE 1997
	TOTAL AMOUNT PROVIDED THRU FY-95	AMOUNT EXPENDED BY Sept 30. 1995	AMOUNT COMMITTED Sept. 30 1995	BALANCE AVAILABLE 30-Apr 1996	**BARE MINIMUM**
San Diego State University Foundation					
Program Costs	$423,311	$345,549	$77,762	$0	$69,209
Procurements for SDSUF	$6,009	$231	$5,778	$0	$8,482
Direct Expenditures by SDSUF in Support of Israeli Subgantee	$145,830	$113,125	$32,705	$0	$41,372
Direct Expenditures by SDSUF i n Support of Moroccan Subgantee	$470,173	$402,635	$67,538	$0	$79,477
SDSUF Indirect Costs	$479,385	$402,837	$76,548	$0	$169,074
Sub-Grant Ben-Gurion University of the Negev	$877,789	$708,765	$169,024	$0	$249,026
Sub-Grant Maghreb Agriculture Company of the Kingdom of Morocco	$1,433,060	$1,172,931	$260,129	$0	$487,290
TOTAL	$3,835,557	$3,146,073	$689,484	$0	$1,103,930

ATTACHMENTS

A. *Promotional Brochure for Transplants*

B. *Extension Technical Report*

C. *List of Farmers in Azemour and Agadir Who Purchased Transplant Materials in 1995*

A. Promotional Brochure for Transplants

AMARIS Nurseries - Pepinière

AIT MELLOUL

Funded by : THE UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

Pourquoi les Plants Maraîchers de la Pépinière AMARIS AIT - MELLOUL

Haute qualité	Homogénéité
Précocité	Economie
Production diversifiée	Assistance technique

Grâce à une équipe sélectionnée de chercheurs, Ingénieurs et Techniciens, et aux Conditions de Production de Pointe AMARIS - AIT MELLOUL vous garantit :

PLANTS SAINS ET VIGOUREUX

Les plants sont sains et d'une très bonne vigueur

HOMOGENEITE ET FACILITE DE MANIPULATION

Les plants Maraîchers d'AMARIS - AIT MELLOUL sont homogènes et faciles à manipuler au transport et à la plantation

Oulja de Chtouka - Azemmour - Tél. : 03-35-75-05 / Casablanca, 36 / A Blvd. d'Anfa - Tél. : 02-25-16-45 /
Ait Melloul - AGADIR - tél : 08-24-24-49

PRECOCITE

Une reprise rapide et parfaite des plants permet une bonne précocité de production.

ECONOMIE

- Gain de 20 % par rapport aux plants produits par l'agriculteur lui-même.
- Gain de temps : les plants sont disponibles selon le calendrier de plantation.
- Gain d'espace et d'investissement.
- Gain sur les intrants.

PRODUCTION DIVERSIFIEE

AMARIS - AIT MELLOUL produit les plants de toutes les espèces et variétés maraîchères à la demande de l'agriculteur.
L'agriculteur peut soit apporter ses propres semences, soit confier à AMARIS le soin d'acquérir les semences des cultivars désirés.

ASSISTANCE TECHNIQUE

AMARIS - AIT MELLOUL assure une assistance technique après-vente par des visites régulières des exploitations. l'élaboration de fiches techniques et l'organisation de séminaires.

Oulja de Chtouka - Azemmour - Tél. : 03-35-75-05 / Casablanca. 36 / A Blvd. d'Anfa - Tél. : 02-25-16-45 / Ait Melloul - AGADIR

B. Extension Technical Report

Technical advise is provided to farmers in three stages: 1) pre-planting advise; 2) detailed instructions on planting, irrigation and agri-management of transplants is offered when transplants are delivered to the farmers; and 3) a follow-up visit is made 10 to 15 days after delivery of the plant materials.

The following report was provided to one of Amaris Nursery's medium scale farmer during the second visit by Amaris staff.

MAGHREB AGRICULTURE

Société Anonyme au Capital de 1.000.000 DH

CASABLANCA, le 07 Sept 1995

RAPPORT TECHNIQUE

Mr. ARSALANE
TEL : (08) 82-09-63
FAX : (08) 82-28-16

Lors de notre 1ere visite sur le terrain de culture de M. FADDOULI, technicien et moi-même avons remarqué les faits syivants :

- La propriéte est composé de 2 serres d'environ 1 hectare chacune dont 2 sont plantées en plants de tomate de la pépinière AMARIS.

1 - Les 2 serres ne sont pas couvertes de plastic. Il y'a uniquement du plastic ou des filets sur les contours. (utilisés comme brise vent)

2 - Une des serres est mélangée en 2 variétés différentes de tomate : LUANA et tomateb grappe.

3 - Il y'a en transplantation d'une serre à l'autre de plants de tomate pour combler les manquants de l'autre serre. (risques important pris vu la manière de procèder).

4 - Ceci a été efféctué alors que cette serre comporte plusieurs plants non-dédoublés (2à3 plants vigoureux trouvés à plusieurs reprises pour la place d'un seul).

36 A, Boulevard d'Anfa - Tél : 27.16.45 / 27.89.85 - Fax : 27.89.85 - RC N° 68623 - CASABLANCA

MAGHREB AGRICULTURE
Société Anonyme au Capital de 1.000.000 DH

[redacted].....

5- Il aurait donc été plus logique de d'abord dédoubler ces plants, et les replanter dans cette méme serre , avant de transplanter les autres plants venant de la serre mitoyenne .

6- Vu la période de l'année dans laquelle on se trouve , des dizaines et dizaines de plants ont souffert de part et d'autre à cause des intempéries climatiques ::

- vent violents
- chaleur torride
- ensoleillement maximal

Malgrè cela, on peut remarquer que la plupart des plants AMARIS résistent et réstent vigoureux .

7- Le programme d'irrigation est le suivant :

10 minutes d'irrigation / fertigation données le matin les dosages en engrais ont été observés et une proposition de meilleur programme sera donnée lors de la prochaine visite (le 14 SEPT 1995) par M.ABDELRANI (technicien) . En tous les cas il y'a déja été conseillé d'apporter Plus d'eau à ces plants vivant jusqu'à aujourd'hui en plein air :

- 15 à 20 minutes d'irrigation le matin
- 15à 20 minutes d'irrigation/engrais le soir

Ce programme ne sera en vigueur que jusqu'à fin Septem!

36 A, Boulevard d'Anfa - Tél : 27.16.45 / 27.89.85 - Fax : 27.89.85 - RC N° 68623 - CASABLANCA

Casablanca le .....

8 - Des tests ont été effectués sur le PH de l'eau et d'autre tests sur l'arrivée aux plants ont été demandés .

Nous avons remarqué que ces appareils qui servent à mesurer les données concernant l'eau et les engrais n'ont jamais été ulilisés , mais M.FADDOULI était en possession de ces appareils(on les avait acheté) au moins depuis une année .

9 - Nous avons remarqué que certains plants dans certains endroits des 2 serres étaient attaqués (pourriture du collet) . Etant en possession de CRYPTONOL celui-ci aurait du être utilisé avant la mort de ces plants

10- Les délais pour attacher les plants à leur ficelle est largement dépassé , et ceci a causé la brulure de plusieurs plants, car poussés par le vent contre le plastic brulant du paillage . Ce retard a par la méme occasion engendré certains retards au niveau de la croissance du plant , car au lieu de pousser vers le haut , le plant se trouve stressé et poussé vers le coté .

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Il a été recommandé de mettre le plus vite possible une equipe qui s'occupe d'attacher les plants à la ficelle pour éviter que les dégats s'emplifient ou que les plants soient stréssés au départ déja .

En quoi cette visite fut elle bénéfique au producteur ?

1- Correction de l'apport en eau ;

2- Correction de l'apport en oligo-éléments ;

3- Conseils sur les techniques d'attaches (plants/ficelle) qui diminue de moitié le temps de main d'oeuvre ;

4- Pousser les résponsables à utiliser les appareils de mesures ;

5- Pousser les résponsables à se rendre fréquemment dans les serres , au milieu des plants et à les observer ;

36 A. Boulevard d'Anfa - Tél : 27.16.45 / 27.89.85 - Fax : 27.89.85 - RC N° 68623 - CASABLANCA

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FINANCIER

En ce qui concerne la propriété

Elle se trouve à 1 à 2 km de BIOUGRA , l'eau est douce et pompée àpartir d'environ 30m du puit .

La terre est sablonneuse , les vents sont violents et tourbillonnent l'ensoleillement est important .

Il s'agit de serres multichapelles pour plantation de bananes donc hautes (plus de 5m de hauteur) .

C'est la 3^{eme}année que des cultures de tomates y sont réalises d' affilé .

Le sol est traité chaque année au bromure de methyl en localisé .

Il existe une unité de fertigation , une chambre pour stocker les produits phyto-sanitaires , ainsi qu'une petite demeure servant de bureau .

En ce qui concerne les plants venant d'AMARIS , c'est à dire la totalité , nous observons que ceux - ci sont vigoureux et prometttant (saint et résistants)

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Mais n'oublions pas qu'ils sont sortis de pépinière trop tardivement , qu'ils vivaient (ou vivent) en plein air ; en plein été à biougra , et qu'ils ne recevaient que trés peu (trop peu) d'eau et que le programme de fertigation (engrais apportés) n'est pas (n'etait pas) des meilleurs pour ce stade de la plante ;

36 A, Boulevard d'Anfa - Tél : 27.16.45 / 27.89.85 - Fax : 27.89.85 - RC N° 68623 - CASABLANCA

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C. List of Farmers in Azemour & Agadir Who Purchased Transplant Materials in 1995

Azemour: Farmers Who Purchased Transplant Materials during July - October 1995						
		Number of Transplants Purchased				
Name of Farmer	# of Hectares**	July	August	September	October	**Total**
Sayrah Rachid	4			11,407	11,968	23,375
Fgan	10				176,228	176,228
Ben Kibal	5		60,484	4,625		65,109
Laguiti	2				21,318	21,318
Oukal	2.5		11,407			11,407
Badaoui Ali	2		10,846			10,846
Khaji	40	936,429	604,576	184,382	4,488	1,729,875
Ghallab*	2				40,770	40,770
Totals		936,429	687,313	200,414	254,772	**2,078,928**
* The client did not pick up the transplants after ordering them.						
** Small Farmers: 1-7 hectares						
Medium Farmers: 8-19 hectares						
Large Farmers: 20 plus hectares						

List of Farmers in Agadir

Agadir: Farmers Who Purchased Transplant Materials during July - October 1995		
Name of Farmer	# of Hectares*	**Total Number of Transplants Purchased**
Tomassous	large (40)	588,000
I Kamel Iraqui	large (40)	301,448
Adardour	large (40)	235,474
Bennani	small (5)	45,738
Benayad	small	21,000
Cherradi	small (7)	75,000
Arsalane & partners	small (7)	157,705
Filali	small	24,310
Hajji	small (3)	19,000
Bouhia	small	7,750
Janah	medium (10)	130,381
Mouhcine	small	30,668
Total Sales		**1,636,474**
* Small Farmers: 1-7 hectares		
Medium Farmers: 8-19 hectares		
Large Farmers: 20 plus hectares		