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Regional Cooperation Project Office
103 SA-2
Washington, D.C. 20523-0223

 - (1) Agency for International Development
Global Bureau
Regional Cooperation Officer (G/HCD/PP)
Room 609 SA 18
Washington, D.C. 20523-1815
- Provided to:*
- (1) Winrock International Institute for Agricultural Development
Project Officer
Petit Jean Mountain
Morrilton, Arkansas 72110-9537

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Submitted by:
SAN DIEGO STATE UNIVERSITY FOUNDATION

Please address comments or inquiries to:
Dr. Mohamed El-Assal
U.S. Project Coordinator
San Diego State University Foundation
San Diego, California 92182-1900

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c. Progress this Reporting Period (continued).

Some irrigation systems types tested at the Maryut site have been delivered to, and are now being used by, local Western Desert farmers. In cooperation with the ARC's Central Laboratory for Agricultural Expert Systems, comparison tests between agromanagement systems recommended by the expert systems laboratory and those which are being tested at Maryut, are being carried out.

Fertigation and chemigation packages are being refined and are being added to the instructional materials prepared for use by local farmers. Evapotranspirational studies continue on peppers, melons, and tree fruits. For some open field crops, additional irrigation parameters, such as frequency, rates, emitter density, and depth, are being refined to optimize production efficiencies and crop quality.

Irrigation systems are being combined with organic manure variables, and the most effective of these are established as demonstration plots for local farmers during regular field days. Research results obtained this season have indicated that studies with micro-nutrient additions are a logical extension to the field demonstration plot.

Biofertilizer applications in relation to seed germination in cucumber (Biet Alpha variety), are showing the effectiveness on seed germination and growth, as well as their disease resistance in relation to production and post-harvest stages. Organic fertilizers are being tested in sand cultures used for cantaloupe production. The effects on plant growth, flowering dates and yield are being evaluated.

3. Crops and Cultivars:

- a. Goal:** "Ornamental test crops will include roses and "easy to grow" flowers in a non heated greenhouse, a number of flower varieties in a tunnel, others grown in the shade of a screen house, and cut foliage in a greenhouse. Species of vegetables to be tested under cover will be tomatoes, peppers, cucumbers, eggplants, melons, squashes, water melons, beans, sweet corn, and strawberries, with major emphasis on tomatoes."

b. Workplan Activities for this Reporting Period.

The ornamental crops and vegetable species being tested reflect the need for area farmers to produce cost-effective, competitive crops for selected area markets, as well as for export.

c. Progress this Reporting Period.

Activities in crops and cultivars are evident throughout all segments--protected agriculture, open field, nursery, and post-harvest--of the program in Egypt.

Selection of the most favorable species, and further development of those species is being carried out.

c. Progress this Reporting Period (continued).

Egyptian scientists are also studying and perfecting the direct seeding of cucumber using wood ash as a protectant from field varmints. Experiments on promising lines of tomatoes grown in calcareous soils indicate that five new lines shown promise; in cucumber experiments, six new lines have shown promise and trials will be expanded in the next growing season.

In ornamental research, scientists are conducting fertilization experiments on carnations and roses grown in calcareous soils. Studies of irrigation levels and their effects on productivity, flowering date and quality are being conducted on *Gladiolus*. Organic fertilizer testing is underway on one variety of bird of paradise, using a commonly obtainable chemical fertilizer. Comparisons are being recorded on the productivity and quality of the flowers.

B. OPEN FIELD INTENSIVE CROP RESEARCH

1. **Goal:** "Open field research will center on (1) ornamental crops of turf, flowers from Seeds, flowers from bulbs, and branches for floral decoration; and (2) vegetable crops such as asparagus, artichoke, lettuce, sweet corn, processing tomatoes, and potatoes."

2. **Workplan Activities for this Reporting Period.**

The production of vegetable varieties in calcareous soils is being emphasized. Studies on potatoes, broccoli, beans and tomatoes were conducted.

3. **Progress this Reporting Period.**

Findings, including crop production, management, and economic assessment, are under preparation as extension service aids for application by area growers. In trials, GA applications to enhance earliness in artichokes have produced a 14-day improvement over the control group. An NKP fertilization program for potatoes grown in calcareous soil is evaluating their ability to grow in such regimes. In broccoli research, three levels of plant densities were planted and evaluated. Evaluation on edible quality was conducted. Postharvest, precooling and storage studies were carried out in cooperation with the faculty of Alexandria University. Seeds of beans were mixed with biofertilizers and mycorrhiza before planting, and evaluations of yield, plantation dates and postharvest quality are under study. Soil preparation for tomatoes in calcareous soils is underway in relation to effects on properties and impact on growth and yield. The use of plastic houses for summer production is also being studied.

One important aspect of the open field research has been undertaken with sweet peas. Local growers requested an evaluation of different planting methods and plant densities. A comparison is underway using local farms, while demonstrating local, reasonably priced and easily obtainable materials as a supporting material.

C. TREE CROPS AND GRAPE RESEARCH

1. **Goal:** "Deciduous tree crops and groups that are compatible with relatively warm winters and calcareous soils will be emphasized, including apples, peaches, almonds, apricots, plums, loquat, papaya, olives, bananas, exotic fruits, date palm, and charoub."

2. **Workplan Activities for this Reporting Period.**

Research is concentrating on the development of new varieties for production in the Mediterranean deserts.

3. **Progress this Reporting Period.**

The propagation nursery has been expanded and its products are being distributed to farmers. The tree nursery has also undergone expansion with new seedlings of peach, almond, figs, and banana planted. Outreach activities with selected growers to test new varieties are underway.

The production of tree-ripe Peaches with enhanced shelf life is being conducted, as is the enhancement of chilling tolerance of Nectarines using chemically safe materials. Studies also being conducted include the enhancement of color formation and uniformity of Anna apples, as well as extending their storage life using natural compounds. Other studies on Anna apples are: color formation and storage stability as influenced by changing the PH and formulation of ethephon and the normalization of flowering time using new formulas of dormex. Several varieties of almond and peach trees are being tested for salt tolerance to determine their potential for production in saline soils.

D. NURSERY

1. **Goal:** "A nursery will be established near the main desert highway connecting Cairo and Alexandria to supply farmers with high-quality plant material that will be the basis of modern intensive agriculture in the Western Desert. Plants propagated in the nursery will also be sold to the market. Propagation material will be produced in the categories of landscaping, ornamentals, vegetables, and fruit trees."

2. **Workplan Activities for this Reporting Period.**

The production of plant materials for replication for area farmers is the objective.

3. **Progress this Reporting Period.**

The propagation nursery has been expanded and its products are being distributed to farmers. During this report period, seedling production on tomato, pepper, eggplant, cantaloupe and cucumber have produced a distribution of more than 990,000 vegetable seedlings to growers and new lands settlers within the Maryut region. Fruit tree nursery production for area farmers has included apple, pomegranates, banana, figs and grape seedlings. Rootstocks of almonds, apple, apricot, and grapes have also been distributed by nursery scientists to area farmers.

3. Progress this Reporting Period (continued).

Maryut nursery staff have been active in interactions with area farmers and growers, regularly assessing their needs and responding with quality products for their use. In response, one example is the testing of small scale, low cost plastic houses and tunnels as viable production methods for small-farm users.

E. POST-HARVEST HANDLING

1. **Goal:** "Post-harvest research will deal with: optimal time of day for harvesting; determination of the ripening stages; sorting and grading; sterilization; storage temperatures and longevity of storage; treatments for preservation, such as waxing and thin plastic films; application of preservatives to flowers to extend shelf life; and development of packaging methods and testing of packing materials."

2. **Workplan Activities for this Reporting Period.**

A post-harvest laboratory was built during the Maryut I Program to serve the research during the present project. Work by Egyptian scientists incorporates a wide range of aspects, such as shelf life of the varieties of vegetables and fruits under study, packaging, optimal storage conditions, and small-scale processing (pickling, jam production, etc.), of the products.

3. **Progress this Reporting Period.**

Post-harvest evaluations have been conducted on all vegetables grown at the Maryut site, with a particular emphasis on shelf-life and taste. This information is now being used to establish future priorities to ensure that the quality of material, its reliability, and movement into post-harvest packages will be optimal for use by growers.

A small cold storage facility is operational as is the picking line. The cold storage facility allows Maryut researchers to conduct studies which are applicable to many area growers, and are oriented to application by these users. Evaluations of packaging and handling are underway on numerous crops. Several types of fruit dryers are under evaluation, along with associated picking studies. The goal is develop useful alternatives for local growers to develop a range of crops using similar raw materials.

Postharvest activities in the current reporting period have included the study of the different crops and varieties and the evaluation of their initial quality at harvest as well as during the postharvest handling stages. Unrefrigerated handling—in concert with the needs of area growers and farmers—has been given special attention.

Research is underway on daily weight loss of different fruits and vegetables in order to determine the period of time before shriveling appears. The objective will be to advise handlers and retailers on selling times for optimal prices.

3. Progress this Reporting Period (continued).

Simulated studies on cold storage or shipment conditions were carried out in collaborative efforts with the University of Alexandria's postharvest laboratory.

Demonstration research on the effects of precooling and hot water treatments has been carried out on a number of crops, among them, artichoke, beans, broccoli, cucumber, pepper, and tomato. The evaluation of ten newly selected lines of tomatoes was conducted in terms of harvest maturity, initial quality and postharvest behavior. Harvesting of the tomato fruits with or without calyx was tested in relation to shelf life with a goal of helping area breeders select the most promising lines good for production in calcareous soils.

F. TRAINING AND EXTENSION

1. **Goal:** "The Maryut site will serve as a center for large-scale training of farmers and extension workers in the Western Desert, primarily by on-the-job training methods. Field days will be conducted periodically during the year to demonstrate crops, cultivars, technologies, and management systems developed and tested at the site. Four to six extension workers will be employed to supply extension services to all farming communities in the newly-reclaimed lands."

2. **Workplan Activities for this Reporting Period.**

Maryut II researchers are currently producing and designing a number of publications that will be distributed to aid the area farmers in producing new crops being developed at the site. Cost-effective methods and effective techniques will be emphasized in these instructional publications.

3. **Progress this Reporting Period.**

Several innovative training programs, international tours and extension visits have been held at the Maryut site. For example, pomology students from Alexandria University have conducted training, new land settlers from several surrounding regions have undergone extension visits, and local farmers and new university graduates interested in arid lands farming have participated in observational or extension visits.

In addition, three graduate students are active researchers at the Maryut site.

Agricultural representatives from more than 40 countries have toured the Maryut site. In addition, local growers were visited by project scientists who demonstrated a number of new techniques.

Maryut scientists have developed extension publications specifically dealing with tomato growing in calcareous soils, producing economical yields of grapes, and a quick guide for growing vegetables in the Western Desert. All are aimed at providing assistance to area farmers and growers.

The Program in Israel

A. DEVELOPMENT OF NEW CUT FLOWERS FOR WINTER MARKETING

1. **Goal:** "Production of winter cut flowers for export has consistently expanded in Israel, but competition has increased due to increased exports from other countries and new greenhouse technologies in Europe and North America. New Technologies have resulted in the need for more flexibility in changing species and cultivars. For plants successfully tested, this research will provide complete data for the horticultural industry in the Negev as well as researchers in Maryut."

2. **Workplan Activities for this Reporting Period.**

Species selected for cultivation include *Limonium perezii* and *Aclichrysum cassinarnum*. These species can be grown in the open field over a relatively short time, as well as on a wide range of soils under high saline conditions.

3. **Progress this Reporting Period.**

Research activities with *Limonium* characterize plant responses to four salinity levels which typify the current quality of water found in the Arava Valley. A primary task has been quantitative treatment effects on cut flower production parameters and upon cut flower quality related to shelf-life. Plant material being used is a Japanese hybrid which has good commercial prospects. Plants were established on fresh water before the salinization treatments were initiated. Plans for this research segment initially targeted the Ramat Negev Research Station, but research has been shifted to the Ben Gurion University in Beer-Sheva.

During the past year, groups of plants from two *Limonium* cultivars, Emily Tall and Emily Pink, were irrigated with salinated nutrient solution in three concentrations to produce increasing saline levels. Flowers were harvested each week and the length of the stem determined as a quality marker for the flowers. Flowers that were produced in a controlled greenhouse developed longer stems and produced fuller inflorescences in these trials.

B. NATIVE ANNUAL PLANTS FOR ENVIRONMENTAL GARDENING

1. **Goal:** "In view of the increasing use of native annuals in gardening and landscaping, the botanical and horticultural characteristics of Israeli annual flora will be studied in order to develop them on a commercial basis for use at the Maryut site. Native annuals will be evaluated in their natural habitats by seeding them in a simulated garden and on the basis of other available information. Selected species will be collected and research undertaken on methods of seed storage, germination under various conditions, growing seedlings, planting, and seed maturity and collection."

2. **Workplan Activities for this Reporting Period.**

Trees, shrubs, small shrubs and creepers that can tolerate drought are under investigation.

2. Workplan Activities for this Reporting Period (continued).

Most species selected have undergone acclimatization in Israel and have demonstrated their ability to withstand climatic, soil, and water conditions similar to those prevailing in the Maryut region. Species under study include: *Callitris verrucosa*, *Myrporaceanae*, *Bouganvillea spp.*, and *Mimosaceae*.

3. Progress this Reporting Period.

The orange-flowered *Gypsophylus* is being developed for production in the Negev Desert. This variety represents a long-day plant which needs a short induction cycle to produce flowers during the winter period. The plant responds with the development of initials, but buds abort with stress. Studies will be extended to other varieties if the persistent need is demonstrated. One current primary limitation in Israeli's desert areas is a lack of cyclic electricity. This research component is evaluating production features and primary constraints under a variety of systems, such as out-of-door, shade, and heated houses to overcome key production constraints and maximize year-around production. Efforts are concentrating upon the characterization of cut flower quality under controlled field conditions and experiments with potted plants in heated houses have shown that CO₂ enrichment improve quality. Investigations are being conducted with CO₂ enrichment and cut flower quality.

C. DEVELOPMENT OF WOODY PLANTS AS CUT FLOWERS

1. Goal: "Research subjects for *Thamnus*, *Protea*, and *Lilum* species will include collection and initial evaluation of gene pool, cultivation under laboratory conditions, propagation, growth requirements, control of growth and flowering, post-harvest studies, experimental plantations, export trials, and breeding."

2. Workplan Activities for this Reporting Period.

Studies include crop selection and ways to eliminate the intensive culture and high level of expertise required to produce these crops. In many cases, experience has shown that investment in structures such as greenhouses or nethouses is required. Once the branch is detached the flowers require attention beyond the norm. Most of the species selected for trials can be grown in open fields, which will reduce costs. Although requiring a higher investment than decorative branches, flowering branches generally bring a higher return.

3. Progress this Reporting Period.

Results from trials plots are under continuing examinations and appraisals. The goal will be to eliminate the high cost and levels of expertise generally associated with woody plants grown as cut flower crops.

D. EUCALYPTUS FOR FLOWERING AND DECORATIVE BRANCHES

1. **Goal:** "Flowering eucalyptus research will address propagation, dwarfing."
2. **Workplan Activities for this Reporting Period.**

Eucalyptus and other flowering and decorative branch plants/trees can be grown in the open at a relatively low cost. Cultivation is generally less intensive than for flowering branches and requires less special expertise or extra manpower. Species selected for trials can be grown in open field plantings, which is designed to reduce costs to the farmers. Most of the trials plants can be dried, tinted, and preserved, a feature that enhances their marketability. Other species other than Eucalyptus were also selected for trials. These include: *Mimosacanae*, *Acacia ballenana*, *A. pupura*, *Myrtaceae*, and others.

3. **Progress this Reporting Period.**

Approximately 400 dunams of Eucalyptus introduced from the Project are under commercial production in Israel. Approximately 40,000 cut branches per dunam per year are expected from this new introduction. The salt tolerant response of six Eucalyptus species (small trees and shrubs), are being investigated at salt levels of 1, 5, 10, and 15 dS/m. Seven additional species of uncertain salt tolerant status are also being evaluated in an observational plot. Preliminary experiments are underway to evaluate the potential of scouring rushes for the commercial production of cut branches.

In other trials, eight shrub species and eight Eucalyptus species were planted in the Ramat Negev Experimental Station in order to evaluate the effects of salinity on the production of decorative branches. Plants were irrigated with 1.2, 4, 8, and 12 dS/m water. Each water quality treatment was replicated four times in a random block design. First harvests of eight species occurred during the current reporting period. In these early trials, all species are showing a high degree of salt tolerance. *Olearia axilaris*, *Maireana sedifolia*, *Eucalyptus kruceana* and *Bacharis sarothroides* had no yield reduction at Ecw of 12 dS/m, while the other four species were more sensitive. Trials will continue in order to assess the long term effects of salinity on performance.

E. CONTROL OF TOMATO QUALITY

1. **Goal:** "This research will seek to establish correlation between growing conditions, physical and chemical parameters, and organoleptic conditions. Consumer response and preferences will also be studied."
2. **Workplan Activities for this Reporting Period.**

In recent years, it has been found that salinity improves the quality, taste, and color of tomatoes. Commercial application has mainly been with large tomatoes (variety 144). It was found that this variety was suitable for growing in the early part of the season, but that the size of the fruit was severely affected by salinity at the end of the growing season.

2. Workplan Activities for this Reporting Period (continued).

Since it is not desirable to depend solely upon one suitable variety, testing has been launched on additional varieties that will give comparable results to that of variety 144 under the saline conditions found in the Negev Desert.

3. Progress this Reporting Period.

Experiments are continuing on the effects of brackish water on tomato quality. Two primary components are being evaluated. One component involves verifying that taste quality can be indirectly measured by glucose quantity. A simple inexpensive refractometer developed by the Project team continues to provide encouraging results, correlating management practices, glucose content, and flavor quality.

Experiments with crops grown on sandy soils and irrigated with brackish water, and with crops grown on salinized soilless media have similarly shown that overall taste quality in tomatoes increases with decreasing water quality. Data on these findings are being correlated to develop packages for growers. Maryut scientists are also examining media by salinity interactions on yield and fruit quality. Media under investigation include sandponics, perlite, and cinder, as well as heavier soils. Of particular interest is the establishment of long-term yield versus quality constraints.

In the production of high-quality greenhouse tomatoes, researchers have developed a reliable method for the evaluation of taste quality. Analysis of the relationship between flavor scores, as evaluated by a trained tasting panel and chemical analysis of various compositional parameters in the fruit, revealed a good correlation between overall taste and glucose content. Preliminary results are showing that the concentration of glucose is affected by salinity and weather conditions.

F. PROTECTED AGRICULTURE

1. Structures:

a. **Goal:** "Various greenhouse structures and coverings will be tested, including glasshouses, plastic covers, and screen houses. Research efforts on non-conventional energy sources on greenhouse warming will be increased."

b. Workplan Activities for this Reporting Period.

The intent of this research segment is to find ways to produce the majority of the crops at the most desirable economic period for off-season crops. A number of greenhouse coverings and design structures will be tested. In addition, various methods of growth containers will be investigated for each crop, in order to augment yield. Structures will be heated by geothermal sources.

c. Progress this Reporting Period.

The evaluation of various greenhouse structures and coverings is continuing. A new solar greenhouse accommodating all previous findings has been erected at the Ben-Gurion University.

c. Progress this Reporting Period (continued).

Oriented east-west, the new structure capitalizes on winter solar irradiation, while its southern side extends outward with a low air volume. This solar "trap" design contains re-configured water sleeves to trap and store the heat. A reflective curtain has been positioned above the sleeves and a new night heat-trapping curtain system is being installed. In addition, solar "boilers" are being evaluated at the Ramat Negev site in order to assist farmers in winter heating. The idea is to cut costs for traditional heating in winter, making the tomato or melon crops more cost-effective for farmers to produce.

Melons are also receiving intense attention in Israel, with the goal to improve their viability for year-around production. Israel's melon production in mid-winter has not been of sufficient quality to meet export standards and experiments are underway to evaluate the production of this crop in solar greenhouses. Researchers are investigating density-harvest functions for each planting season versus salinity treatments, with other variables that include plant shaping.

2. Management Systems:

a. Goal: "Research will concentrate on optimization of melon management in greenhouses to include densities, pruning techniques, and nutrient requirements and management of greenhouse tomatoes for optimal fruit quality (cultivars, nutrition, growth media, etc.)."

b. Workplan Activities for this Reporting Period.

In 1991-92 tests (Maryut I), melon varieties were found that grew well under saline conditions on loess soils. However, a large part of the melons in the Negev highlands and the Arava are sown on sandy and very light soils. Current experiments are intended to test for the hardiest varieties under such conditions. Other factors under investigation include the design of a compact melon plant which grows in saline conditions, selection of hothouse tomatoes grown with saline water, and the mineral nutrition requirements in vegetables grown under saline irrigation.

c. Progress this Reporting Period.

Melon varieties for growth in sandy soils under saline conditions and drip irrigation methods are being examined. Experiments are also under way for a variety of irrigation regimes in order to determine the optimum regime. In designing a compact melon plant that grows well in saline conditions, Maryut II scientists are testing nutrient requirements. Various levels of micro and macro-nutrients are being examined in relation to the character of the plants produced (number of leaves, density of plants, number of fruit per plant), and on melon quality. Chemical analysis on the fruit, and on various parts of the plant, is also progressing.

c. Progress this Reporting Period (continued).

In recent experiments, Galia type cultivar C8 was planted on levelled sand dunes at Ramat Negev Experimental Station, with six experimental treatments arranged in five randomized blocks. The treatments were: irrigation with 7.2 dS/m water at 1, 3, 6, and 9 times a day, starting with 6 irrigations a day and reducing to 3 per day during fruit filling. Only the one to three irrigations per day regime produced yield increases in these recent tests.

G. OPEN FIELD INTENSIVE CROP RESEARCH

1. **Goal:** "Open field research will center on (a) flowers from seeds, (b) hardy woody ornamentals for decorative branches, and (c) vegetables crops such as potatoes."

2. **Workplan Activities for this Reporting Period.**

Trees with decorative branches and flowering branches, as well as pot plants, ornamental garden plants and varieties to be marketed as cut flowers will be planted in open fields at the Ramat Negev Research Station.

The suitability of potatoes for cultivation on very light soils is well-known, however, little information is available on the tolerance of potatoes grown under saline drip irrigation on very light soils. The cultivation of potatoes on sand dunes, using saline water, is now underway in Israel.

3. **Progress this Reporting Period.**

Research efforts are being directed towards melons and potatoes for out-of-doors production. Potato production for fresh use under saline irrigation treatments (ca. 6.2 dS/m) have been encouraging. A series of pulse irrigation treatments have been evaluated for potatoes grown on sandy soils, with no distinct advantages noted. One effect of the salinity was the presence of a thin cuticle, and water loss in the potatoes was quite high. Use of low tunnels was also found to be non cost-effective for growers.

At Ramat Negev Experimental Station, seventeen potato cultivars were grown under five levels of salinity in irrigation water ranging from 1.2 to 6.2 dS/m. Cosmos, Desiree, Shipodi, and Lady Roseta were the most promising cultivars in the current tests.

Traditionally, melon production has taken place on heavier soils. Maryut scientists are examining melon management techniques on sandy soils with saline irrigation water (well water carrying 6.2 dS/m). Treatments for late summer melons were one to six pulsed irrigations per day, with changes in frequency, but not in volume. Higher frequency of pulsed irrigation resulted in better yield with better plant response, but lower pulses had higher salt buildup. In the latter case, plants slowly recovered but were stunted in growth. Planting time and temperature interactions are also being investigated for enhancement of out-of-season products.

H. TREE CROPS AND GRAPES RESEARCH

1. **Goal:** "Research efforts will be increased on deciduous tree crops (pears, peaches, and exotic fruit) that are compatible with relatively warm winters and calcareous soils. Emphasis will be on the selection of salt-tolerant root stocks and the introduction of new salt-tolerant cultivars which are of critical importance to both Israel and Egypt."

2. **Workplan Activities for this Reporting Period.**

Selection of deciduous tree crops and grapes that are compatible with relatively warm winters and calcareous soils has been completed for the first trials period.

3. **Progress this Reporting Period.**

The effects of salinity stress on grape productivity and berry quality for wine production is under investigation. Efforts continue in the screening root-stocks for assessment of their salt tolerance.

Field work is being conducted at the Ramat Negev Experimental Station, whereas laboratory studies are centered at the Laboratory of Horticultural Research at Rehovot. Due to economical considerations based upon the expected profitability of the various crops, concentration is being given to those crops which have specific advantages for the desert climate and soils, as well as the ability to produce quality crops under saline conditions. Reasonable costs and seasonable considerations are also factors in selection.

Wine grapes have these advantages and trials are underway on a vinyard of Cabernet Sauvignon on two root stocks (140 Ruggeri and Salt Creek), which are found to most salt tolerant. Varying levels of salinity for irrigation are being used and the first crops are being tested for mineral content. After harvest, researchers plan to produce wines for testing for aroma and flavor analysis.

Researchers have identified an apricot cultivar, Mishmish Clabi, which is relatively salt tolerant and contains a boiling stable protein 66kd which increases with the salinity of the irrigation water. Researchers believe that this finding may open new possibilities for selecting salt tolerant cultivars and rootstocks at an early stage.

I. POST-HARVEST HANDLING

1. **Goal:** "Research will deal with analysis of fruit quality parameters such as acidity, pH, and starch content; studies of shipping and shelf life after shipping; and economic evaluation of quality control measures."

2. **Workplan Activities for this Reporting Period.**

Maryut II participants designed and planned research programs that will address the optimal time of day for harvesting, determination of the ripening stages, sorting and grading of crops, sterilization, storage temperatures and longevity of storage, treatments for preservation, extending shelf life, fruit quality, packaging materials, studies of shipping and shelf life after shipping.

3. Progress this Reporting Period.

Research programs to accomplish the work plan goals are being applied throughout all the research activities. One necessary function, documenting the commercial feasibility of specific treatments and varietal interactions, continues.

II. CHANGES IN PERSONNEL

There are no changes to report.

III. TRAVEL

Travel is detailed in Appendix A.

IV. MEETINGS AND COLLABORATIVE ACTIVITIES

The Maryut II Project has two equally important goals: 1) to strengthen and expand cooperative scientific exchange among Egyptian, Israeli, and United States participants, and 2) produce tangible applied results that are in concert with the development goals of the Governments of Egypt and Israel. The San Diego State University Foundation, contract administrator for the Maryut II Project, has initiated a number of mechanisms to foster success for the two goals. These mechanisms are an integral part of the program's management practices and are a key for continuing success.

Cooperative activities include: 1) Steering Committee meetings; 2) annual workshops; 3) visitations among scientists; 4) technology exchange; and 5) the newsletter and other publications.

Maryut II Program Attendees: CALAR II Project Fifth Annual Workshop, Alexandria, Egypt; March 11-15, 1995

The Egyptian and Israeli members of the CALAR II Project met in Egypt from March 11-15 to exchange scientific results and ideas, as well as to review scientific progress. Attendees from the Maryut II Project were: Drs. Nemr Mohamed Ayesh; Samir Osman El-Abd; Mahmoud O. El-Banna; Abdel-Ghany El-Gindy; Shafik El-Gindy; Mahmoud Hafez; Gamil Khalifa; Mohamed Abdel-Latef Nopal; Abd El-Aziz Okail; Abdel Sheta; Said Singer (Egypt), and Mohamed El-Assal (United States).

Maryut II Technical Committee Meeting, Alexandria, Egypt, June 13-15, 1995

The Maryut Technical Committee met from June 13-15, to review progress to date, visit research sites, and plan activities for the 1995 growing season. During formal sessions Alexandria, more than 30 papers were presented, outlining research results and plans to the Committee.

**Maryut II Technical Committee Meeting, Alexandria, Egypt,
June 13-15, 1995 (continued)**

Attendees were: Drs. Awad Hussein; Ahmed Salam; Assen Shaltout; Abdel El-Gindy; Shafik El-Gindy; Abdel Sheta; Mahmoud Hafez (Egypt); and Yossef Ben-Dov; Dov Sitton; Dov Pasternak; Ruth Shilo (Israel); and Mohamed El-Assal (United States).

Maryut II Steering Committee Meeting, Tel-Aviv, Israel, June 18-20, 1995

Following the Technical Committee meetings, the Steering Committee met in Tel-Aviv to review program progress, budgets, and approve technical plans for the forthcoming growing season. Attendees were: Dr. Abdel-Ghany El-Gindy and Mr. Mohamed Dessouki (Egypt); Dr. Samuel Pohoryles; Dr. Itzhak Abt; and Dr. Irit Rylski (Israel); and Mr. Harry Albers and Dr. Ronald Hopkins (United States). Other participants were: Dr. Dov Pasternak (Israel); and Dr. Mohamed El-Assal; Ms. Frea Sladek; and Ms. Davene Gibson (United States).

CALAR II/Maryut II Projects External Evaluation, Israel and Egypt, January 4-25, 1995

In order to provide maximum efficiency and cost-effective measures, the Agency for International Development Regional Cooperation Programs conducted their external evaluation of both the CALAR II and Maryut II Programs concurrently. Members of the External Evaluation Review Team were: Dr. Rodney Fink (Team Leader); and Drs. Mary Peet; Jody Garbe; and David O'Brien. Dr. Mohamed El-Assal, U.S. Project Coordinator, accompanied the team during their visits to project sites in Egypt and Israel.

Scientific Visitations, January 26-29, 1995 and March 17-22, 1995

One of the key cooperative activities of the Regional Cooperation Programs are the scientific visitations, through which scientists from the participating countries travel to one another's research sites in order to collaborate as a team. Two such Scientific Visitations occurred during the reporting period. In January, Drs. Irit Rylski; Youssef Ben-Dov; Ben Ami Bravdo; Omar Zaiden and Itzhak David of Israel visited their Egyptian colleagues to conduct joint research activities. U.S. Coordinator Dr. Mohamed El-Assal worked closely with the collaborators. In March, Drs. Adel Kader and Michael Reid of the United States joined Dr. Yossef Ben-Dov of Israel in an additional collaboration with Maryut II participants in Egypt.

V. PROCUREMENTS

Procurements are shown in Appendix B.

VI. PUBLICATIONS AND INTELLECTUAL PROPERTY RIGHTS

There are no refereed publications to report during the current reporting period. Regular publications such as the newsletter and this report provide the means for the dissemination of project research, results, and cooperative activities.

Such publications also serve as an informal record of the project for its participants and as an informational tool for those interested in Regional Cooperation Programs.

The San Diego State University Foundation's policies on Intellectual Property Rights and Patents were detailed in our original proposal (pages 4-23 through 4-24), and agreements are in effect among participants from the three countries involved in the Maryut II Project.

VII. PROBLEMS AND ACTIONS TAKEN TO SOLVE THEM

The Maryut II Project operates with more than six years of experience in conducting successful cooperative technical activities among its participants, the Technical and Steering Committees, and its managing entities. This strong basis for cooperation plays a key role in alleviating the effects of adverse political and scientific tensions that may occur. Regular meetings among the coordinators, the Technical Committee, and the Steering Committee play an important role in assuring that program goals and objectives are being met. No problems of any significance occurred during this reporting period.

VIII. TRUE COLLABORATION

Efforts will be made, where applicable and when in the interest of the Maryut II Project, to interface with other Regional Cooperation Programs.

IX. WORKPLANS FOR SUBSEQUENT 6 & 18 MONTHS

The workplans will follow those proposed to and approved by the Agency for International Development.

In addition to the approved workplans, Maryut II participants will concentrate upon adopting the recommendations made by the External Evaluation Team in January 1995.

**APPENDIX A
TRAVEL**

Maryut II Travel Expenditures for October 1, 1994--September 30, 1995

Amount	Name	Date	Explanation
\$3,830.00	Amir Abdalla	8/19-10/14, 94	Sci. vis. at University of Arizona, Tucson.
\$8,577.31	Mohamed El-Assal	10/9-11/6, 94	Morocco Project Steering Comm. Meet.; Managerial visit to Cairo.
\$3,273.65	Shafik El-Gindy	10/16-11/2, 94	Scientific visit to California and Arizona.
\$2,125.04	Warren Jones	10/16-11/2, 94	Escorting Shafik El-Gindy during his scientific visit to California and Arizona
\$268.90	Ralph Ortega	10/16-18, 94	Escorting Shafik El-Gindy during his scientific visit to California and Arizona
\$977.89	Hassan El-Banna	10/16-11/1, 94	Escorting Shafik El-Gindy during his scientific visit to California and Arizona
\$3,799.44	Hamdy El-Doweny	10/30-11/13, 94	Cucurbitaceae 94 Conf., S. Padre I., TX; sci. vis. to Weslaco & Kingsville, TX and Raleigh, NC
\$2,534.79	Abdel-Ghany El-Gindy	11/4-11, 94	15th Annual Irrigation Expo/Tech. conf., Atlanta, GA, 11/4-11, 94
\$815.27	Dov Pasternak	11/11-13, 94	Managerial visit to Cairo, Egypt.
\$3,475.14	El-Sayed El-Naggar	11/12-25, 94	Scientific visitation to Seattle and WDC
\$3,525.45	Aida Saber Ghazy	11/27-12/12, 94	Scientific visitation to UCLA
\$1,418.45	Abdel-Azim El-Hammad	12/11-18, 94	Scientific visit to Riverside, CA and College Station, TX
\$358.86	Daniel Lineberger	12/13/18, 94	Escorting El-Hammady during his scientific visit to College Station, TX.
\$4,367.38	Mohamed El-Assal	1/2-2/8, 95	CALAR/Maryut External Evaluation: Egypt/Israel. Expenses split between CALAR & Maryut.
\$4,575.95	Atiat El-Menshawy	1/15-2/3, 95	Scientific visitation to UCLA

Scientific Visitation, Egypt, Jan. 26-29, 1995

(Includes air transportation, lodging, per diem, and all misc. expenses.)

\$755.05	Youssef Ben Dov	
\$747.32	Irit Rylski	
\$715.49	Ben Ami Bravdo	
\$714.43	Omar Zaiden	
\$751.51	Itzhak David	
\$3,683.80	Total	

Maryut II Travel Expenditures for October 1, 1994--September 30, 1995

Amount	Name	Date	Explanation
	CALAR II 5th Annual Scientific Workshop, Alexandria, Egypt, March 11-15, 1995.		
	(Includes air transportation, lodging, per diem, registration, and all misc. expenses.)		
\$155.00	Nemr Mohamed Ayesh		Per diem only
\$793.00	Samir Osman El-Abd		
\$155.00	Mahmoud O. El-Banna		Per diem only
\$793.00	Abdel-Ghany El-Gindy		
\$793.00	Shafik El-Gindy		
\$793.00	Mahmoud Hafez		
\$155.00	Gamil Abdalla Khalifa		Per diem only
\$793.00	Mohamed Abdel-Latef Nopal		
\$155.00	Abd El-Aziz Okail		Per diem only
\$690.00	Abdel-Aziz Sheta		
\$793.00	Said Singer		
	\$6,068.00	Total	
	Scientific Visitation, Egypt, March 17-22, 1995.		
	(Includes air transportation, lodging, per diem, and all misc. expenses.)		
\$800.70	Adel Kader		
\$658.50	Youssef Ben Dov		
\$658.50	Michael Reid		
	\$2,117.70	Total	
\$168.82	Abdel-Aziz Sheta	4/12-14, 1995	Visit to San Diego CALAR Office while traveling with outside program
\$208.33	Abdel-Ghany El-Gindy	4/12-14, 1995	Visit to San Diego CALAR Office while traveling with outside program
	Maryut II Technical Committee Meeting, Alexandria, Egypt, June 13-15, 1995.		
	(Includes air transportation, lodging, per diem, and all misc. expenses.)		
\$90.00	Ahmed Salem		Per diem only
\$90.00	Assen Shaltout		Per diem only
\$90.00	Abdel-Ghany El-Gindy		Per diem only
\$90.00	Shafik El-Gindy		Per diem only
\$90.00	Abdel-Aziz Sheta		Per diem only
\$90.00	Mahmoud Hafez		Per diem only
\$90.00	Hisham El-Saeed		Per diem only
\$90.00	Atiat El-Menshaway		Per diem only

Maryut II Travel Expenditures for October 1, 1994--September 30, 1995

Amount	Name	Date	Explanation
\$45.00	Hisham El-Shoura		Per diem only
\$654.00	Yossef Ben Dov		
\$651.00	Dov Sitton		
\$911.00	Dov Pasternak		
\$654.00	Ruth Shillo		
\$11,150.22	Dr. Mohamed El-Assal	6/9-8/9, 95	Includes Maryut Steering Committee Meeting, Maryut Soil Productivity and Managerial Travel
\$14,785.22		Total	

Maryut II Steering Committee Meeting, Tel Aviv, Israel, June 18-20, 1995.

(Includes air transportation, lodging, per diem, and all misc. expenses.)

\$818.00	Abdel-Ghany El-Gindy		
\$896.00	Mohamed Dessouki		
\$122.00	Irit Rylski		
\$4,534.00	Harry Albers		Includes managerial travel to Cairo, Egypt, 6/20-22.
\$4,357.00	Ron Hopkins		
\$994.00	Yarkon Tours		Misc. expenses including meeting rooms, breaks, and ground transportation.
\$10,727.00		Total	

Int'l Symposium on Salt-Affect Lagoon Ecosystems, Valencia, Spain, Sept. 17-26, 1995

(Includes air transportation, lodging, registration, per diem, and all misc. expenses.)

\$3,190.85	Ayman Abou-Hadid		
\$3,192.37	Sayed Singer		
\$6,383.22		Total	
\$6,500.00	Mohamed El-Assal	10/8-11/8, 95	Managerial travel to Cairo, Egypt.
\$95,559.61	Grand Total		

APPENDIX B
PROCUREMENTS

Maryut II Equipment Procurement Report, October 1, 1994-September 30, 1995

P.O. #	Date	Vendor	Qty.	Description	Amount	Total
	10/6/94	Mohamed Hassan		Construction: Maryut Soil Prod. Lab Building	\$17,251.34	\$17,251.34
164142	10/10/94	Foundation Plant Materials	90	Cosmo 2--Grape rootstocks	\$450.00	\$4,005.00
			32	Cosmo 10	\$160.00	
			100	Couderc 1613	\$300.00	
			80	Couderc 1616	\$400.00	
			100	Freedom	\$300.00	
			100	Harmony	\$300.00	
			100	Kober 125AA	\$300.00	
			50	Millardet et de Grasset 101-14	\$250.00	
			90	Oppenheim #4 (SO4)	\$450.00	
			35	Richter 99	\$175.00	
			20	Ruggeri 225	\$100.00	
			10	Saint George	\$50.00	
			10	Salt Creek	\$50.00	
			100	Teleki 5A	\$300.00	
			80	Teleki 5C	\$400.00	
				Certificates/misc	\$20.00	
164231	10/25/94	Campbell Scientific	1	9 pin peripheral to Rs232 Intfc #SC532	\$171.00	\$177.00
				S&H	\$6.00	
164232	10/25/94	Irrrometer Company	50	Replacement ceramic tips	\$362.50	\$376.53
				S&H	\$14.03	
	10/27/94	International Moving Service		Shipment of Maryut Soil Lab Equipment	\$26,651.50	\$26,651.50
	11/8/94	Mohamed Hassan		Construction: Maryut Soil Prod. Lab Building	\$12,634.13	\$12,634.13
	11/16/94	Mostafa Ahmed		Construction: Maryut Sorting Building	\$3,597.47	\$3,597.47
	11/21/94	Mohamed Hassan		Construction: Maryut Soil Prod. Lab Building	\$8,024.89	\$8,024.89
	11/28/94	Mohamed Hassan		Construction: Maryut Soil Prod. Lab Building	\$16,144.83	\$16,144.83

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Maryut II Equipment Procurement Report, October 1, 1994-September 30, 1995

P.O. #	Date	Vendor	Qty.	Description	Amount	Total
	12/6/94	Mostafa Ahmed		Construction: Maryut Sorting Building	\$3,322.29	\$3,322.29
164143	12/17/94	AgriSun Nursery	10 kilos	Pyrus Communis Kieffer Seed	\$300.00	\$7,347.75
			100 kilos	Nemaguard Seed	\$3,300.00	
			150 kilos	Burkett Pecan Seed	\$750.00	
			100 kilos	Pyrus Communis Bartlett	\$2,000.00	
			50 kilos	Stark Red Leaf Peachseed Certificates/misc	\$875.00 \$122.75	
	12/22/94	Mohamed Hassan		Construction: Maryut Soil Prod. Lab Building	\$5,980.30	\$5,980.30
	1/2/95	Mostafa Ahmed		Construction: Maryut Sorting Building	\$5,980.30	\$5,980.30
	1/11/95	Relocations Services Int'l		Shipping to Maryut Site, Alexandria, Egypt AgriSun seeds	\$3,607.00	\$3,607.00
	1/18/95	Mohamed Hassan		Construction: Maryut Soil Prod. Lab Building	\$8,374.21	\$8,374.21
	2/10/95	Mostafa Ahmed		Construction: Maryut Sorting Building	\$9,494.17	\$9,494.17
30245	2/17/95	AgriSun Nursery	20	All-in-One Almond	\$90.00	\$2,704.40
			100	Earli Sun Apricot	\$450.00	
			2000	Emla 7 Liners	\$1,500.00	
			2120	Cold Storage Units	\$318.00	
			2120	Packaging	\$106.00	
				Certificates/misc	\$240.40	
	3/3/95	International Moving Service		Shipment of Maryut Soil Lab Equipment	\$1,315.81	\$1,315.81
2950	3/16/95	Carter Seeds	3 oz	Acacia aneura E987	\$45.00	\$1,036.00
			3 oz	Acacia stenophylla EE435	\$66.00	
			3 oz	Acacia salicina EE219	\$66.00	
			3 oz	Albizzia julibrissin EE565	\$12.00	

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Maryut II Equipment Procurement Report, October 1, 1994-September 30, 1995

P.O. #	Date	Vendor	Qty.	Description	Amount	Total
			3 lb	Baccharis pillularis E833	\$15.00	
			1 pkg	Callistemon citrinus C896	\$3.50	
			1 pkg	Callistemon viminalis E887	\$3.50	
			3 oz	Campsis radicans EE577	\$18.00	
			1 m	Carissa grandiflora	\$12.00	
			3 oz	Cassia eremophila EE462	\$24.00	
			3 oz	Cassia artemisioides EE101	\$21.00	
			4 oz	Cassia phyllodena EE003	\$10.00	
			4 oz	Cercidium floridum E322	\$12.00	
			4 oz	Cercidium microphyllum EE237	\$20.00	
			4 oz	Chilopsis linearis EE461	\$25.00	
			4 oz	Encelia farinoa D938	\$8.00	
			3 oz	Eucalyptus erythrocory C613	\$45.00	
			3 oz	Eucalyptus papuana E534	\$150.00	
			3 oz	Eucalyptus spathulata E619	\$60.00	
			3 oz	Eucalyptus torquata	\$54.00	
			1 m	Nerium oleander fiesta pink C913	\$35.00	
			3 oz	Parkinsonia aculeata F072	\$15.00	
			3 oz	Pinus canariensis E372	\$15.00	
			3 oz	Pinus eldarica E962	\$12.00	
			3 oz	Pinus edulia EE527	\$24.75	
			3 oz	Pinus halepensis D1051	\$15.00	
			3 oz	Pinus monophylla EE550	\$21.00	
			1 lb	Pinus pinea D426	\$9.00	
			3 oz	Pinus roxburghii D384	\$12.75	
			3 oz	Pistachia chinensis EE646	\$19.50	
			3 oz	Pistachia atlantica E279	\$36.00	
			1 m	Pithecellobium flexicaule F136	\$18.00	
			3 oz	Prosopis chilensis EE098	\$18.00	
			3 oz	Prosopis pubescens E845	\$24.00	
			3 oz	Rhus ovata EE564	\$18.00	
			4 oz	Simmondsia chinensis F100	\$12.00	
			4 oz	Sophora secundiflora E944	\$9.00	
			1 m	Tecoma stans E152	\$7.00	

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Maryut II Equipment Procurement Report, October 1, 1994-September 30, 1995

P.O. #	Date	Vendor	Qty.	Description	Amount	Total
			3 oz	Ulmus parvifolia EE612	\$5.00	
				Certificates/misc	\$40.00	
164136	3/21/95	Willits & Newcomb	10 Qts	C-35 Citrange seeds	\$730.00	\$3,162.00
			10 Qts	Carrizo Citrange Seeds	\$710.00	
			15 Qts	Rangpur Lime Seeds	\$855.00	
			10 Qts	Volkamericana Seeds	\$730.00	
				Certificates/misc	\$137.00	
	3/22/95	Mostafa Ahmed		Construction: Maryut Sorting Building Sanitary drainage system	\$1,833.28	\$1,833.28
	3/22/95	Mostafa Ahmed		Construction: Maryut Sorting Building	\$5,393.81	\$5,393.81
164926	4/12/95	Relocations Services Int'l		Shipping to Maryut Site, Alexandria, Egypt AgriSun, Foundation Plant Materials, Carter Seeds, Willits & Newcomb	\$5,310.00	\$5,310.00
	4/20/95	Mostafa Ahmed		Construction: Maryut Sorting Building Sanitary drainage system	\$6,817.24	\$6,817.24
41033	5/30/95	Wild Seeds	3 oz.	Atriplex canescens	\$6.00	\$506.50
			3 oz.	Baileya multirdiata	\$30.00	
			3 oz.	Brahea armata	\$9.00	
			3 oz.	Calliandra eriophylla	\$48.00	
			3 oz.	Dyssodia pentachaeta	\$30.00	
			3 M	Fouquieria splendens	\$24.00	
			3 M	Hytis emoryi	\$30.00	
			3 M	Macfadyena mnguis - Cati	\$24.00	
			3 oz.	Melampodium lecanthum	\$60.00	
			3 oz.	Oenothera berlandieri	\$30.00	
			3 M	Oenothera caespitosa	\$60.00	
			3 oz.	Prosopis velutina	\$21.00	
			3 oz.	Salvia coccinea	\$30.00	

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Maryut II Equipment Procurement Report, October 1, 1994-September 30, 1995

P.O. #	Date	Vendor	Qty.	Description	Amount	Total
			3 M	Vauquellina californica	\$24.00	
			3 oz.	Zinnia grandiflora	\$36.00	
				Certificates/misc	\$44.50	
30915	5/4/95	Campbell Scientific	2	Telephone Modem	\$590.00	\$649.25
			2	Surge Protection Kit-6362	\$40.00	
				Shipping	\$19.25	
30914	5/26/95	Baxter Scientific	1	Probe 3310, C8089-10	\$147.60	\$926.53
			1	Conductivity Meter Set M126	\$768.59	
				tax	\$10.34	
	7/4/95	Mostafa Ahmed		Construction: Maryut Sorting Building Sanitary drainage system	\$8,829.62	\$8,829.62
	7/8/95	Mostafa Ahmed		Construction: Maryut Sorting Building Steel shed for grinding samples	\$1,995.58	\$1,995.58
				Equipment purchased locally by Dr. Mohamed El-Assal for Maryut II Site		
	7/7/95			Wire and hose	\$2.36	\$253.68
	7/13/95			Stablizer and electrical outlets	\$163.72	
	7/14/95			Plumbing supplies	\$10.18	
	7/14/95			Chemical solvents	\$30.81	
	7/14/95			Plastic ware	\$20.06	
	7/17/95			Extension cord	\$3.54	
	8/4/95			24 Cardboard filing boxes	\$23.01	
				Equipment purchased locally by Dr. Mohamed El-Assal for Maryut II Soil Productivity Lab		
	7/6/95			Electrical supplies	\$16.30	\$27,662.49
	7/10/95			Cement for repairs	\$2.80	
	7/13/95			Electrical current stablizers & transformers	\$756.64	
	7/14/95			Two (2) 30-liter water distillers	\$4,719.76	
	7/16/95			Fawcet	\$3.24	
	7/16/95			Hoses and switches	\$60.86	

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Maryut II Equipment Procurement Report, October 1, 1994-September 30, 1995

P.O. #	Date	Vendor	Qty.	Description	Amount	Total
	7/17/95			Electrical supplies	\$97.35	
	7/17/95			Ventilation pipes	\$138.86	
	7/17/95			Plumbing supplies	\$88.38	
	7/17/95			Water heaters (2)	\$217.70	
	7/17/95			Carpenter supplies: wood	\$21.76	
	7/17/95			Carpenter supplies: Hardware and paper	\$9.59	
	7/18/95			Electrical supplies	\$1.47	
	7/18/95			Light bulb	\$2.36	
	7/18/95			Paint	\$3.54	
	7/18/95			Stainless steel sheets for fume hood	\$100.29	
	7/20/95			Drill bit	\$0.88	
	7/21/95			Electrical supplies	\$63.86	
	7/25/95			Venetian Blinds	\$1,661.17	
	7/28/95			Stainless steel pipes, 20 & 12 cm	\$54.50	
	7/28/95			Ventilation pipe	\$7.37	
	7/28/95			Nails	\$1.48	
	7/29/95			Pipe--1 meter long	\$2.95	
	7/29/95			Nails	\$2.36	
	7/29/95			Electrical supplies	\$11.24	
	7/29/95			Tool box and tools	\$178.98	
	7/30/95			Electric supplies	\$10.32	
	7/30/95			Nitrose oxide (1 bottle)	\$196.31	
	7/30/95			Acetelene and regulator (2 bottles)	\$342.33	
	7/30/95			Two (2) Water pumps	\$9,457.50	
	8/2/95			Water Still, double type	\$2,642.00	
	8/3/95			Refridgerator	\$485.25	
	8/3/95			Regulator hoses	\$12.39	
	8/3/95			Plastic sheet	\$34.81	
	8/3/95			Gas bottles (2)	\$91.06	
	8/7/95			Flame Photometer	\$4,880.30	
	8/8/95			Compressor, 25 liters	\$191.51	
	8/3/95			Chemicals:		
			Unit	Qty	Name	
			1 liter	15	Hydrochloric Acid	\$31.54

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Maryut II Equipment Procurement Report, October 1, 1994-September 30, 1995

P.O. #	Date	Vendor	Qty.	Description	Amount	Total	
			1 ltr	10	Acid Nitric 68 %	\$119.76	
			1 ltr	5	Acetic Acid Glacial	\$18.11	
			1 ltr	2	Hydrofluoric Acid 40 PC A.R	\$26.94	
			1 ltr	2	Acid Perchloric 70%	\$7.18	
			1 ltr	5	Orthophosphoric Acid 85%	\$28.81	
			1 ltr	1	Ammonium Hydroxide 32% D.O 89	\$3.29	
			1 ltr	4	Chloroform	\$19.16	
			1 ltr	5	(983) Ethanol (Ethl Alcohol) Abdolut GR	\$89.82	
			1 ltr	2	Acetone Pure	\$7.90	
			1 ltr	5	Hydrogen Peroxide 30 PC	\$22.45	
			500 gms	1	Sodium Thiosulphate 5 H2O	\$1.29	
			500 gms	20	Sodium Hydroxide Pellets	\$29.94	
			1 kg	2	Sodium Hydrogen Carbonate	\$1.49	
			500 gms	10	Sodium Acetate Anhydrous	\$21.85	
			1 kg	5	Sodium Chloride	\$11.52	
			500 gms	5	Sodium Carbonate Anhydrous	\$8.23	
			500 gms	1	Zinc Metal Powder	\$4.28	
			25 gms	3	Silver Nitrate Crystal	\$163.98	
			500 gms	2	Potassium Permanganate	\$3.95	
			500 gms	2	Potassium Sulphate	\$6.94	
			500 gms	4	Pot. Phosphate (Dibasic)	\$23.95	
			500 gms	2	Potassium Chloride	\$3.29	
			1 kg	2	Potassium Dichromae Powder	\$23.95	
			500 gms	4	Magnesium Chloride	\$14.49	
			500 gms	1	Lead Chloride	\$28.44	
			500 gms	1	Lead Sulphate	\$12.27	
			100 gms	1	Phosphothalein	\$2.47	
			25 gms	2	Methyl Orange	\$13.47	
			25 gms	2	Methyl Red	\$14.97	
			5 gms	3	Bromocresol Green AR (PH Indicator)	\$29.64	
			25 gms	3	Eriochrome Black T	\$17.96	
			500 gms	3	Pot. Phosphate Monobasic	\$6.58	
			500 gms	2	Potassium Carbonate Anhydrous	\$8.23	
			500 gms	5	E.D.T.A. Di Sod Salt	\$35.32	

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Maryut II Equipment Procurement Report, October 1, 1994-September 30, 1995

P.O. #	Date	Vendor	Qty.	Description	Amount	Total
			1 ltr	2 Ethylene Glycol, 99 + %	\$14.97	
			100 gms	1 Ammonium Meta-Vanidate	\$11.97	
			1 kg	5 Boric Acid	\$13.47	
			1 kg	1 Diphenyl Amine	\$17.96	
			250 gms	2 Ammonium Molybdate	\$20.74	
			500 gms	1 Ammonium Fluoride	\$11.85	
			500 gms	2 Amm Chloride Pure BP 30	\$2.63	
			500 gms	2 Barium Chloride	\$3.95	
			500 gms	2 Barium Sulphate for x-rays	\$4.49	
			500 gms	5 Ammonium Acetate	\$16.46	
			500 gms	5 Ferrous Ammonium Slphate A.R.	\$15.71	
			500 gms	1 Ferric Chloride	\$9.73	
			500 gms	4 Calcium Chloride Dried	\$26.34	
			500 gms	5 Calcium Carboanate	\$8.23	
			1 kg	2 Copper (ICO Suphate 5 H2O	\$7.18	
			10 gms	4 Curcumme	\$41.91	
			250 gms	1 Charchol Activated for Gas Absorption	\$1.97	
Grand Total						\$201,364.90

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