

Introduction

ICARDA's Arabian Peninsula Regional Program (APRP) serves the seven countries of the Arabian Peninsula Bahrain; Kuwait; Qatar; Saudi Arabia; Oman; UAE and Yemen. The present project started in 2000 under the title:

Sustainable Management of Natural Resources and Improvement of Major Production Systems of the Arabian Peninsula

Goal: The development of more productive and sustainable rangeland and irrigated production systems, including protected agriculture, through the more efficient use of the natural resources of the Arabian Peninsula, in particular water, energy and indigenous plant species.

Objectives:

- ❖ Improved targeting of research and technology transfer, land-use planning, and environmental management based on the characterization of the specific potentials and constraints of the diverse agro-ecologies and associated land-use systems of the AP.
- ❖ Improved water-use efficiency and optimal utilization of available water resources in irrigated production systems.
- ❖ Development of integrated range, forage and livestock production systems and management practices for rangeland rehabilitation.
- ❖ Development of a Protected Agriculture industry for the region that meets national demands for more efficient and sustainable production systems and techniques.
- ❖ Strengthened national institutions and human resource capacity, and enhanced technology transfer

Despite the many constraints that faced the program, ICARDA has made considerable progress in addressing the problems facing the region. There have been many successes and accomplishments, achieved primarily through strengthening the capabilities of the NARS, including both technical and human resources.

Summary of Achievements during 2003-2004



Highlights of APRP Collaborative Research & Development Activities

Rangeland and Irrigated Forages

❖ Buffel grass or Lebid (*Cenchrus ciliaris*) has been identified in UAE as forage which offers high quality feed and high water-use efficiency. The forage can be harvested ten times a year, with an average dry matter yield of up to 20 t/ha. The water-use efficiency of Lebid (amounts of water to produce one kg of dry matter) ranges between 0.81 and 1.88 m³ compared with Rhodes grass at 1.18 and 2.13 m³. Irrigated Rhodes grass is widely used as forage by farmers in the Emirates and other AP countries. To demonstrate the new forage to farmers' communities, APRP in collaboration with the Ministry of Agriculture started a program (September 2004) of field verification in the Central Agricultural Region and in Al Ain area, where 5 farmers and 3 government farms have been identified to grow the new forage in relatively large areas (2-10 Donums). The growers were provided with seeds and a field guide (publication) for producing the forage together with regular visits from the forage specialist of APRP and the extension officers from the Ministry. Such efforts would not have been possible without the availability of large quantities of Lebid seeds. Seeds of Lebid and several other indigenous forages are being produced at Dheid Research Station with the help of a seed technology unit which was jointly established by APRP and the Ministry of Agriculture of UAE in July 2002.



On-farm activities to introduce new grass forages with high water-use efficiency in UAE

- ❖ To address the constraint of seed availability of the newly identified forage and range species in the Arabian Peninsula a new seed technology unit was established as a joint effort between APRP and the Ministry of Agriculture and Fisheries in the Sultanate of Oman. The unit was inaugurated during the Board of Trustees Executive Committee meeting in Oman in November 2004. Similarly, another seed technology unit is being established as a joint effort between APRP and the Ministry of Agriculture in Saudi Arabia. The unit will be assigned to Al Jouf in the northern part of the Kingdom, where it is expected to enhance the seed production of range shrubs. Over fifteen tones of shrub seeds were produced during 2004, which are needed for restoration and rehabilitation of rangelands in the Kingdom.



New seed technology unit inaugurated at the agricultural research station, Rumais, Oman

- ❖ Bulk seed multiplication of *Cenchrus ciliaris* L (UAE Accession) and *Cenchrus ciliaris* L (Rumais accession) and *Lasiurus hirsutus* L. (Rumais accession) were produced at Livestock Research Center, Rumais, Sultanate of Oman, during the 2003-2004 season. Total seed yields collected through four harvests were 9.8 kg, 2.4 kg and 0.8 kg, respectively for the three grasses. Seed production in summer was greater than seed production in winter. These studies suggest that seeds of perennial grasses like *Cenchrus* and *Lasiurus* can be produced in Oman throughout the year.
- ❖ Two indigenous rangeland forage species viz. *Cenchrus ciliaris* L. (UAE) and *Coelachyrum piercei* L. (UAE) collected under ICARDA- APRP “Phase- I” were investigated along with *Chloris gayana* L., to understand the influence of early and late forming tillers on seed weight (with husk) and seed quality from August 2003 to August 2004 at two research stations in Oman (Rumais, Batinah region and Jimah of the Interior region). Samples of inflorescences of both early and late forming tillers of three grasses were collected one week after physiological maturity (1WAPM). The results from five harvests indicated presence of differential expression of seed-related traits in the three grasses. Early forming tillers were superior to late forming tillers in inflorescence weight

(mg), seed recovery (%) from inflorescence and germination %. It is recommended that when harvesting grass seeds emphasis should be given to early formed tillers in order to maximize seed quantity and quality.



Early formed tillers of Dakhna
(*Coelachyrum piercei* L.)



Late formed tillers of Dakhna
(*C. piercei* L.)

- ❖ The morphological characterization of three grasses (*Lasiurus hirsutus* L. (Mahara accession), *Panicum turgidum* L. (Mahara accession)) and *Pennisetum divisum* L. (Mahara accession) were studied during the 2003-2004 season in the Sultanate of Oman using representative samples taken at different growth stages. The accession of *Lasiurus hirsutus* L was characterized by 19 pigmentation characters and 8 morphological traits while the accessions of *Panicum turgidum* L. and *Pennisetum divisum* L. were characterized by 19 pigmentation characters and 11 morphological traits.
- ❖ A field gene bank of indigenous pasture plant species of Oman was initiated in an area of about 1 ha at the Agriculture Research Center, Rumais, during October 2004. The list included a total of 244 pasture plant species belonging to 178 genera and 54 families. The plant species include 73 herbs, 71 shrubs, 38 trees and 62 monocotyledonous grass species.
- ❖ Rangeland degradation is the major problem faced by countries of the Arabian Peninsula. The main cause of rangeland degradation is overgrazing (pasture being utilized at a higher stocking rate than its carrying capacity). In order to define the proper grazing management of rangeland in the arid environment of the Arabian Peninsula, a grazing experiment was started in Al Jouf of the northern Saudi Arabia. The experiment (a joint effort between the Range and Animal Development Research Center and APRP) consists of three stocking rates (low, medium and high), which were achieved by allocating 3 Camels on paddocks of 16.2 ha, 10.8 ha and 5.4 ha, respectively, for the whole year. The above stocking rates were estimated based on vegetation cover of 822 kg/ha (average of the three replications). Considering only 50% of the vegetation is available for grazing (proper use factor), the pasture productivity is estimated to be 411 kg/ha. The large plot has therefore 6658 kg available forage (just enough for 3 camels in the low stocking rate). The other two

treatments (medium and high) will be compensated by supplementary feeding.

The study will monitor vegetation productivity, composition and quality. The parameters to be monitored related to the animal include body weight changes and supplementary feed. Animals will be weighed once every month. The flock composition in each grazing paddock is one male and two females (dry animals). The study was started early December 2004 and is expected to continue for five years.



Over stocking the range with Camels (left) can exhaust vegetation cover while low or no animal grazing allow pasture to recover rapidly (right) in Al Jouf, Northern Saudi Arabia

The Range and Animal Development Research Center provided the pasture and animals (camels), as well as the drinking and feeding troughs and the supplementary feeds needed for the experiment. ICARDA-APRP contributed with the fence and a weighing balance (7000 USD). An automatic weather station was also installed at the experiment site by ICARDA (11, 000 USD).

- ❖ In line with the collection of germplasm (exotic) for rangeland rehabilitation and as alternative forage crop, a number of accessions (38) of spineless cactus (*Opuntia* spp) were introduced by APRP into Oman from Tunisia, early February 2005. The Sultanate of Oman will be the focal point from which the introduction of spineless cactus will be extended to other AP countries. Cactus is well recognized for ability to survive the drought and the harsh environmental conditions. It possesses the physiological characteristic called Crassulacean Acid Metabolism (CAM) in which the stomata open at night allowing water loss and CO₂ uptake. It is also characterized by thick cuticle on the stem, low number of stomata and large number of water storage cells. As an animal feed, cactus is a good source of water, Vitamin A and Ca. It is however deficient in Cp, fiber and minerals such as P. It is best utilized in combination with salt bush.

In Yemen, efforts to rehabilitate Wallan community rangeland continue. The area (20 dounms) is being planted with four shrubs utilizing different water-harvesting techniques. The area is currently being protected from grazing by Wallan community to allow the rehabilitation efforts. Closing of range from grazing for two years now resulted in more than double the forage yield (36.5% in 2004 compared to 21.5% in 2003).

Protected Agriculture and Water

- ❖ Yemen is one of the semi-arid countries suffering from a water balance shortage estimated at 900 million cubic meters. This quantity is compensated through pumping from underground reservoirs. In the absence of adequate charging, the level of underground water has been declining at an accelerating rate.

To overcome this problem, the Yemeni Government has constructed dams and water blockades in different areas. A total of 526 have so far been constructed.

A study was initiated with the help of APRP to assess the level of utilization and benefit of these dams and other water structures. The study covered the Governorates of Dhamar, Ibb and Al-Dhale'a. Available data was collected from the Department of Planning and Department of Irrigation and Water Structures of the Ministry of Agriculture and Irrigation. Necessary contacts and coordination was made with Secretaries of the Local Council in concerned Districts of Dhoran-Anis (Dhamar), Al-Radhmah (Ibb) and Damt (Al-Dhale'a) together with field visits to dam sites.

Results of the study revealed that construction of dams in most cases is made in response to claims of some local personalities with no priori plans. Additionally, there was shortage of studies on various aspects relating to dams and water structures, which resulted in a number of technical and social problems. Down stream farms suffer because of water blocked by the dams. Ineffective and inefficient water transfer to farmers' fields, due to the use of open soil-based canals was also observed.

The study made a number of recommendations: (a) there is need for clear plans for dam construction, operation and maintenance, (b) there is need for involvement and contributions of beneficiaries in all phases of planning and management of dams, (c) need for establishing Water Users' Associations that could ensure sustainability of dam and natural resources utilization

- ❖ The Soilless growing techniques have been successfully developed through a collaborative effort between ICARDA-APRP and several AP countries. The main objectives are to maximize quality and quantity of production per unit of water. Soilless growing techniques are also considered best alternative for deteriorated GH soil due to salt accumulation and infestation with soil-borne pathogens. Simple growing systems were constructed with locally available materials. These systems were developed and tested in Emirates, Kuwait, Qatar, Oman, and Yemen for production of tomato, cucumber, pepper, and lettuce crops.



Adopting soilless growing techniques in the farmers field in Oman: collaborative activities of ICARDA-APRP and MAF, Oman

- ❖ Solarization of the plastic houses has resulted in improved yield and quality of Omar and Lona cucumber varieties in Qatar. The plant height was also affected, being taller under solarization. The study was conducted in 2004 at the Otoria Station of the Department of Agricultural and Water Research, Ministry of Municipal Affairs and Agriculture. In the same study, tomato varieties ‘Ezabella’ and ‘Algora’ showed increase in yield as a result of soil solarization. Similarly the average weight of fruit and plant height were reported higher under solarization.
- ❖ An economic study was carried out in Qatar in 2004, comparing cooled and non-cooled plastic houses for the production of cucumber. The study reported a higher economic return from non-cooled plastic houses during winter and spring.
- ❖ In the summer season, the yield was higher in the cooled plastic house, but this has to be weighed against the cost of electricity and water. The study recommended the use of colored nets to reduce temperature inside the plastic houses in the summer, and to repeat the study for more seasons with other crops such as tomato.
- ❖ A similar study comparing cooled and non-cooled green houses was conducted in the Sultanate of Oman. Two cucumber varieties ‘Printo F1’ and ‘Hana F1’ were planted to evaluate their performance in yield and quality attributes under cooled and non-cooled greenhouses covered with an insect-proof net. The study was conducted during 2003-2004 season at the agricultural research centre (ARC) in a non-replicated plot. The results revealed that although the cooled greenhouse produced highest production (1.7 t/gh) than

non-cooled greenhouse (1.5 t/gh), the cost of production is higher.

- ❖ Three strawberry varieties 'Selected Tahriry,' 'Chandler' and 'Camarosa' were evaluated for their yield performance and quality attributes using hydroponics vertical system techniques at the Agricultural Research Centre (ARC), Oman, during the 2003-2004 season. The experiment was replicated three times in RCD. The results revealed significant ($P < 0.05$) differences in yield and average fruit weight between the varieties. Highest yield was given by 'Selected Tahriry' (2.2 t/720 m²). Total soluble solids varied from 7.0 to 8.2% among the varieties.
- ❖ Introducing IPPM under farmers conditions in Sa'ada Governorate (Sahar District) in Yemen in 2003 indicated significant reduction in the use of chemical sprays (six sprays in the IPPM green house Vs 18 sprays in the control). Yield of cucumber was 15.2 kg/m² under IPPM while in the control the total yield was 12.9 kg/ m². Accordingly the water-use efficiency (WUE) was significantly better under IPPM (32.5kg/m³ compared with 21.8kg/m³ for the control). The economic assessment of the two treatments indicated that IPPM treatment secured an average return of 157% compared to 111.8 % of the control. Farmers' assessments of the IPPM technique were positive. This was reflected in the increased demand for the mesh and plastic mulch in the local markets in Sa'ada as well as from the neighboring Kingdom of Saudi Arabia. It could be inferred that more farmers will ensure the use of IPPM technique because of the obvious benefits gained.
- ❖ The dissemination of IPPM in plastic house cultivation was also studied in Dhamar Governorate in farmers' plastic houses in the central highlands (Dharan Anes). IPPM techniques were applied in a green house of 500 m² area. A neighboring plastic house with the same area was considered a control. The two plastic houses were planted with winter cucumber ('Beta Al-fa'). The objective of the experiment was to demonstrate the effect of the IPPM under farmers' conditions in reducing the reliance on chemicals. The possibility of using alternative methods for control of pests/insects was also explored. The ultimate goal is to produce cucumber crop with minimum use of chemicals at a low cost of production.

The most important results were the low infestation with pests and root knot nematodes, the number of sprays were nill. The infestation was increased to 10, 30, 35% in the case of powdery mildew, mites, leaf miner, respectively. The % plants infected with root knot nematodes were increased to 30% in the control towards the end of the season, despite the fumigation with methyl bromide.

IPPM gave better yield per unit area totaling 11.2 kg/m² with a 5% increase when compared to the control. The net return was 491.2% (which means that every Yemen Rial invested in the cost of production gave return of 4.9 Yemeni Rials). It was strongly recommended to adopt this technique in green house cultivation of crops under the

conditions of the central highlands in Dhamar Governorate.

- ❖ The vertical soilless growing technique has been studied in Oman and Kuwait for the last four years in research stations. After proving successful the technique is now being transferred to farmers' fields. ICARDA-APRP in collaboration with NARS is providing the necessary support and technical backstopping for the local growers who wish to adopt the system.
- ❖ The success story of the vertical soilless growing system in Kuwait and Oman, encouraged NARS in the Kingdom of Bahrain and Kingdom of Saudi Arabia to adopt the technique. Two systems have been developed in Riyadh and Manama by ICARDA-APRP support. Both systems are now under assessment in production.
- ❖ To generate more income for growers, the cultivation of cash crops under the protected agriculture has been introduced in Yemen mountain traces by APRP in collaboration with Yemeni national research institutes. The adoption rate of the system by the growers is increasing rapidly and more new growers are showing interest. ICARDA-APRP is supporting these activities technically and financially. Recently, the French Government showed interest in these activities and supported ICARDA-APRP by financing a new project on rural development based on protected agriculture.



Dissemination of greenhouse production technology to the Yemeni growers



New Projects and Proposals

- ❖ “Supporting Rural Development and Food Security in the Terraces of Yemen: Adoption of Sustainable Protected Agriculture Technology for the Production of Cash Crops in Taz Region”. Project funded by the French Government through its Embassy in Yemen. The initial activities of the project have already started.
- ❖ “Development of Sustainable Date Palm Production Systems in the GCC Countries of the Arabian Peninsula”. Is the title of the project proposal which was developed during the date palm workshop in Abu Dhabi and finalized by ICARDA-APRP. It has been sent to

the GCC countries.

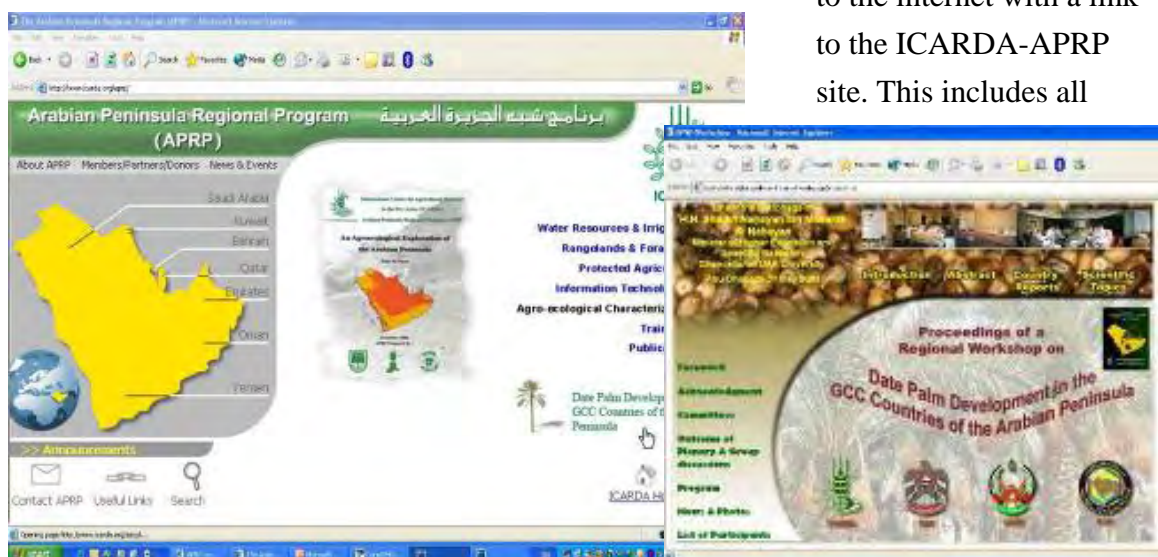
- ❖ “Evaluation and Restructuring of Agricultural Research Systems in the GCC Countries”. The Proposal has been developed by ICARDA-APRP. This proposal is based on the ICARDA-GCC workshop held in February 2005 at ICARDA headquarters.
- ❖ “Agricultural Productivity Improvement: Integration of Research and Extension in Technology Transfer to Rural Communities in Yemen”. Proposal developed in collaboration with ICARDA HQ and presented to USAID.
- ❖ “Promoting Cactus Crop and its Uses in the Arabian Peninsula” is a new project proposal developed January 2005 to be submitted to donors (IDB, AFSED etc.).
- ❖ “The Transfer of Technologies Developed by APRP during Phases I and II to End-Users” is the title of a new project proposal to be submitted to donors.



Information Technology and Networking

- ❖ The whole layout of the ICARDA-APRP website (<http://www.icarda.org/APRP>) has been changed. All the APRP publication and posters are now available for the Arabian Peninsula scientists and researchers interesting in the related subjects. Two Expert Systems for management of cash crop production under GH conditions and calculating plant water requirements are ready for use through the internet. The website also has very detailed information about APRP goals, objectives and workplan for different project components. This site also contains complete contact information for all APRP staff and country coordinators in the seven AP countries. As a result of the improvements, hits to the site have increased from 3,000 (December 2004) to more than 16,000 (March 2005).
- ❖ A complete website for the date palm workshop proceedings was designed and uploaded

to the internet with a link to the ICARDA-APRP site. This includes all



papers and reports presented at the workshop, press releases, pictures and a summary of discussions of working groups during the meeting. www.icarda.org/aprp/datepalm



New Agreements & Memoranda of Understanding

- ❖ A new agreement between ICARDA and the Government of the United Arab Emirates was signed in December 2004. This replaces the old agreement between ICARDA and Ministry of Agriculture and Fisheries, UAE, in 1991.
- ❖ A Memorandum of Understanding (MOU) was signed on 29 May 2004 between the United Arab Emirates University (UAEU) and ICARDA. Prof. Dr Adel El-Beltagy, ICARDA-DG, and Dr Hadeef Bin Jouan Al-Dhaheri, Vice Chancellor of UAEU, signed the MOU. This agreement will open new horizons for cooperation in research, human resource development and exchange of information between the two institutions. The ICARDA office in Dubai will facilitate these linkages



Signing the MoU (Front row) left Dr Hadeef Bin Jouan Al-Dhaheri, Vice Chancellor of UAEU; Prof. Dr Adel El-Beltagy, Director General of ICARDA; and Dr Ahmed T. Moustafa, APRP Regional Coordinator (Standing). Standing at the back from left: H.E. Abdullah Abdul Aziz, Assistant Under Secretary for agricultural affairs, MAF, UAE; H.E. Jassim Mohammed bin Darwish, General Secretariat of UAE Municipalities (GSM); H.E. Saeed Bin-Mohamed Al-Raqabany, Minister of Agriculture and Fisheries (MAF) UAE; H.E. Sheikh Nahayan bin Mabarak Al Nahayan, Minister of Higher Education and Scientific Research and Chancellor of UAEU.

- ❖ A Memorandum of Understanding between ICARDA and Sultanate of Oman for the establishment of a seed technology unit was signed on 22 August 2004 at ICARDA, Aleppo, Syria. The memorandum was signed by H.E. Mr Hilal Ben Salem Al- Sayabi, Ambassador of the Sultanate of Oman in the Syrian Arab Republic, and Prof. Dr Adel Beltagy, ICARDA Director General.
- ❖ A new agreement between ICARDA and The Government of the Kingdom of Saudi Arabia on establishing a seed technology unit is being prepared.



Meetings, Conferences and workshops

APRP Regional Steering Committee Meeting

- ❖ *APRP Steering Committee Meeting* was held on 26 February 2004 in Aleppo, Syria. The meeting was attended by 17 participants, representing 6 countries from the Arabian

Peninsula, two donors and ICARDA. In his opening address, Dr William Erskine (ADG-Research), on behalf of Prof. Dr Adel Al Beltagy, welcomed the Donor representatives Mrs. Ekhlas Najib (OPEC Fund) and Mr. Samir Jarrad (Arab Fund for Economic and Social Development-AFESD) and the participants from Bahrain, Emirates, Kuwait, Oman, Qatar and Saudi Arabia and APRP. He emphasized the importance of the meeting as APRP is coming to its final stages where the guidance of the steering committee is expected to have most significant role.



Dr Ahmed Moustafa, APRP Regional Coordinator, and Dr Ahmed Osman, Pasture and Rangeland Specialist, presented the summary of APRP activities and achievements during the last year. The donors and country representatives endorsed the extension of the project for another year (2005) with no additional funds. AP country representatives also appreciated donors for their contributions and support for APRP and emphasized the importance of the project continuation for research and development activities in the region. At the end of the meeting Mrs Ekhlas Najib (OPEC-Fund representative) indicated that although the contribution of OPEC Fund is small, she felt that the Fund is participating in the big success of APRP. Mr Samir Jarrad (AFESD) expressed his appreciation to ICARDA and assured the meeting of the Arab Fund's interest in the program with special attention and support for training and capacity building in the region. In the last session, the time and location for the next Technical and Steering Committee meetings were decided to be in October 2004 in Oman. These meetings were held in Oman as agreed but the time was moved to 13-17 February 2005.



❖ **The Regional Technical Coordination Meeting (RTCM) of APRP was held at Muscat, Sultanate of Oman, from 13 to 16 February 2005.** 45 participants, representing Agricultural Research Institutes from Bahrain, Emirates, Kuwait, Oman, Qatar, Saudi Arabia and Yemen attended the meeting.

The opening ceremony was under the patronage of H.E. Khalfan Ben Saleh Al-Naibi, Under Secretary, Ministry of Agriculture and Fisheries (MAF) in the main building of the Ministry. The inauguration notes were delivered by Eng. Abdul Aziz Al Harthi, Director of Agricultural Production Research Center, MAF, Oman; Dr Ahmed Moustafa, Regional Coordinator, ICARDA-APRP; Dr Ismail Moharam, Chairman, Agricultural Research Authority, Yemen; Dr Mohamed Al Julaifi, DG of National Research Center, KSA; and Dr Abdullah Aboudi, Director Research and Plant Production Dept., MAF, UAE. During the 3-day meeting scientists from the seven AP countries discussed their research activities and results under the three research themes of APRP (Water Management, Rangeland and Forage Crops, Protected Agriculture). A total of 35 research reports and scientific papers were presented in different sessions followed in each case by discussions. The main subjects were:



- Rangeland: seed multiplication; productivity of forage grasses; irrigated forages; germplasm collection, spineless cactus for forage and for combating desertification.
- Water Management and Irrigation: water-use efficiency; treated waste water; utilization of dam and water reservoirs.

- Protected Agriculture: Integrated Production and Protection Management (IPPM); organic fertilizer; soil solarization; green house (GH) production management; GH cooling.



Four invited experts from UAE Universities, FAO, and ARE participated and provided their inputs and recommendations during the discussions. The invited experts were:

- Dr Ahmed A. Almasoum, Associate Professor of Horticulture, UAE University (UAEU)
- Dr Wilfred Baudoin, Senior Officer, Food and Agriculture Organization, (FAO)
- Dr Fawzy A. Taher, Regional Crop Production Officer, FAO Regional Office for the Near East, Cairo
- Dr Abdul Wahed Mukred, Vice Chairman, Agricultural Research Authority, Yemen



Participants of APRP Regional Technical Coordination Meeting, Muscat, Oman, 13-16 February 2005

A local farmer, Eng. Abdullah Al Farisi, also participated in the meeting and gave a power point presentation, describing his experience growing cucumber under soilless culture. Soilless cultures are techniques introduced by ICARDA-APRP to the region, and are becoming attractive to many growers. Mr Al Farisi is one of the farmers in Oman who received technical help from the research center in Rumais, and from ICARDA-APRP. In

his presentation Mr Al Farisi praised the help he received and expressed his full satisfaction with soilless culture for growing cucumber. The presentation was well received by the participants, and was followed by a long session of question and answers. Mr Al Farisi hosted the participants in his farm during a field trip which was organized at the end of the technical meeting.

SWOT analyses (Strengths, Weaknesses, Opportunities and Threats) were conducted by members of the technical meeting for different APRP components in the final day of the meeting. The technical meeting was followed on 17 February by the steering committee meeting, which was attended by senior representatives of the seven AP countries. The APRP activities and achievements during the last phase of the project on Rangeland and Water, Protected Agriculture and Water, and Information Technology and Networking were presented to the steering committee meeting by Ahmed T Moustafa, Ahmed Osman and Arash Nejatian. Presented to the meeting also were the recommendations from RTCM on SWOT analysis and work plan for 2004-2005 season.

Special visits to the Rumais Agricultural Research Center and Mr Abdullah Farisi's farm were arranged for the RTCM participants on 16 February 2005. During the visit to the Rumais, participants visited different laboratories and sections and received suitable information on research activities by the responsible researchers.



RTCM Participants visiting the Laboratory and research equipment at Rumais ARC





Visiting Eng. Abdullah Farisi GH and soilless systems

- ❖ **The Regional Steering Committee Meeting (RSCM)** of the Arabian Peninsula Regional Program (APRP) was held on 17 February 2005 in Muscat, Sultanate of Oman. Prof. Dr Magdy Madkour, Assistant Director General for International Cooperation (ADG-IC), chaired the meeting. In his opening statement Dr Madkour, welcomed the RSCM members and representatives of AP countries on behalf of Prof. Dr Adel El-Beltagy, the ICARDA DG. He emphasized the importance of APRP as one of the outreach programs which reflects the successful efforts of ICARDA in developing technology and disseminating information and knowledge to clients in the seven AP countries (Bahrain, Emirates, Kuwait, Oman, Qatar, Saudi Arabia and Yemen). He expressed thanks to the Government of the United Arab Emirates for hosting APRP office in Dubai, within the Ministry of Agriculture and Fisheries. He also thanked the Donors (AFSED, IFAD and OPEC Fund) for their financial support to the program. He said the program places major emphasis on water, as reflected in the activities of the program components (Forage/Range and Protected Agriculture). It is encouraging to see that some of the technologies developed by the program components are starting to reach the farmers.



APRP Steering Committee Meeting

This was followed by discussions on ICARDA-APRP activities and achievements, financial situation and future plans and projects.

Regional and International Meetings, Conferences, and Workshops

ICARDA organized a number of seminars and workshops in collaboration with NARS as follows:

- ❖ ***A regional workshop on "Agricultural Research Systems and Strategies in the GCC Countries"*** was organized by ICARDA-APRP in collaboration with the Gulf Cooperation Council (GCC) at ICARDA headquarters on 23-25 February 2004. The workshop was in response to GCC requests for analyzing the agricultural research systems and strategies. Twenty-one participants from GCC countries, GCC general secretariat and ICARDA staff attended. During the three-day workshop, representatives from GCC countries (Bahrain, Emirates, Oman, Qatar and Saudi Arabia) presented the agricultural research status and structure in their countries. The presentations were followed by discussions on proposals for developing the collaborative research within GCC countries.
- ❖ ***ICARDA-GCC Meeting:*** The meeting was held at ICARDA-HQ on 24 February 2004 during the workshop on Agricultural Research Systems and Strategies in the GCC, to discuss the future relationship between ICARDA and GCC; the utilization of the GCC contribution; future projects to be supported; and ICARDA-APRP role. Seventeen participants from GCC countries, GCC general secretariat, and ICARDA management participated in the meeting.



Participants in the Agricultural Research Systems and Strategies in the GCC countries workshop from seven GCC countries and ICARDA

- ❖ ***Development of sustainable systems of date palm in the Arabian Peninsula*** was the subject of a 3-day workshop held in Abu Dhabi 29-31 May 2004. The workshop was organized by ICARDA and the Ministry of Agriculture and Fisheries of the United Arab Emirates in collaboration with the United Arab Emirates University (UAEU) and the General Secretariat of the Gulf Cooperation Council (GCC). Over 70 researchers, date palm specialists and experts were invited. They represented ICARDA, GCC countries (Bahrain, Emirates, Kuwait, Oman, Qatar and Saudi Arabia), Yemen. Experts from Egypt, Iran, Morocco, Sudan, Tunis and USA were also invited along with representatives of FAO, UAEU and Arab Authority for Agricultural Development (AAAD).

The workshop was held under the patronage of H.E. Sheikh Nahayan bin Mubarak Al Nahayan, Minister of Higher Education and Scientific Research and Chancellor of UAEU, who also inaugurated the meeting. In his opening speech Sheikh Nahayan welcomed the participants and stressed the importance of date palm in the Arabian Peninsula and the support given by the United Arab Emirates over the years for date palm research which was carried out by different international organizations. H.E. Saeed Bin-Mohamed Al-Raqabany, Minister of Agriculture and Fisheries highlighted the importance of the workshop and praised the collaboration between ICARDA, the Ministry of Agriculture, the United Arab Emirates University and the GCC in organizing the meeting.



Prof. Dr Adel El-Beltagy, ICARDA DG, welcomed the scientists and experts who arrived from all over the world to contribute to the workshop. Dr El-Beltagy then made a power point presentation, which highlighted the global challenges facing the world today. He highlighted global warming, land degradation, water scarcity, loss of biodiversity and the population pressure on natural resources. He then spoke on the role played by ICARDA in the dry areas, especially those of Central and West Asia and North Africa (CWANA). ICARDA, he added, is using tools of science such as GIS/Remote Sensing, climate change monitoring systems, Biotechnology/Genomics; Bioinformatics; Modeling; Expert Systems/Information Technology and the participatory approach. He stressed the importance of investing in research as the only means to address all the challenges facing our world. He concluded by thanking UAE for hosting the workshop on date palm which was neglected for a long time.



From Left Dr. William Erskine, ICARDA ADG for Research; Prof. Dr Adel El-Beltagy, DG ICARDA; H.E. Sheikh Nahayan bin Mabarak Al Nahayan, Minister of Higher Education and Scientific Research and Chancellor of UAEU; H.E. Saeed Bin-Mohamed Al-Raqabany, Minister of Agriculture and Fisheries in United Arab Emirates

A special visit was organized for invited participants of the workshop to a tissue culture laboratory producing date palm transplants, a farm, and a date factory.

- ❖ ***“Traveling Road Show”***; ICARDA-APRP in collaboration with scientists from Vermont University, USA, organized a meeting with officials in UAE to introduce a new concept called “traveling road show”, where scientists, researchers and extension officers meet with farmers and growers to exchange ideas and knowledge on disease and pest management. Two-day meetings: one at the Private Department of His Highness Sheikh Zaid Bin Sultan Al Nahyan in Abu Dhabi on 1 March 2004 (10 participants) and the second at the Ministry of Agriculture and Fisheries in Dubai on 2 March 2004 (15 Participants) were organized by ICARDA-APRP.



- ❖ ***“ICARDA Experience in Using Cactus as a Fodder to Combat Desertification in the Dry Areas”*** was the title of a one-day workshop organized by ICARDA-APRP in collaboration with MAF, UAE, on 30 June 2004. The seminar presented was made by Dr Ali Nafzavi, ICARDA Consultant. Seventeen participants from different departments of MAF participated in this meeting. The presentation was followed by a question and answer session.



- ❖ ***The 44th Meeting of the Board of Trustees of the International Centre for Agricultural Research in Dry Areas (ICARDA)*** opened at Al Bustan Palace Hotel on 6 November 2004 under the auspices of H.E. Dr Rawyah bint Saud Al Busaidiyah, Minister of Higher Education, Sultanate of Oman.

Addressing the opening ceremony, Khalfan bin Saleh Al Na’abi, undersecretary of the Ministry of Agriculture and Fisheries, said ICARDA made good efforts in stimulating agricultural research on field and forage crops and plant genetic resources. As a result, he said, new species were introduced in the Sultanate’s farms which resulted in an increase

of 15 per cent in wheat and barley productivity.



From Left H.E. Khalfan bin Saleh Al Na'abi, Undersecretary of the Ministry of Agriculture and Fisheries; Prof. Dr Adel El-Beltagy, Director General ICARDA; H.E. Sheikh Salim bin Hilal al Khalili, Minister of Agriculture and Fisheries; H.E. Dr Rawyah bint Saud Al Busaidiyah, Minister of Higher Education; H.E. Mohammed Al-Oraimi, Undersecretary for Environmental Affaires; and Mr Omar Al-Marhoon, DG of Administration and Finance, Ministry of Agriculture and Fisheries.

The Undersecretary said ICARDA's Arabian Peninsula program had contributed to research on greenhouse vegetable crops, introduction of technologies for efficient use of water for agricultural purposes which would save 30 to 50 per cent of water consumption. The Undersecretary said the Ministry in cooperation with ICARDA conducted a number of surveys to identify and collect genetic resources of indigenous shrubs and forages. He added that ICARDA also provided support in establishing a seed technology unit at Rumais Agricultural Research Center. The opening ceremony was attended by H.E. Sheikh Salim bin Hilal Al Khalili, Minister of Agriculture and Fisheries, undersecretaries and officials. ICARDA's BoT Executive Committee members visited the collaborative research activities in Oman on 7 November.



The Chairperson of ICARDA's Board of Trustees and the Director General inaugurated the Seed Technology Unit at Rumais, established in collaboration with ICARDA. The national staff, who received training at ICARDA, proudly explained the operations of the Unit to the visitors.

The members visited the Agricultural Research Center, where they witnessed the application of soilless culture techniques and Integrated Production and Protection Management program (IPPM) for the production of high quality vegetables and fruits.

Visits were also made to the food science, biotechnology, bio-control and toxicology laboratories.



- ❖ ICARDA's Board of Trustees visited ICARDA APRP office in Dubai on 11 November 2004. During this visit Dr Ahmed Moustafa, ICARDA-APRP Regional Coordinator, and Dr Ahmed Osman, Rangeland and Pasture Specialist, presented the APRP history and activities in the region.



- ❖ ***International Workshop on Artificial Intelligence (AI)*** in Agriculture has been organized by ICARDA-NVRSRP and CLAES in Cairo from 8-10 March 2004. ICARDA-APRP sponsored 2 participants from UAE.

ICARDA-APRP was represented during a number of regional and international meetings, seminars and workshops

- ❖ ***The FAO Agriculture, Land and Water Use Commission for the Near East (ALAWUC)*** held its Third Session in Doha, Qatar, on 9-11 March 2004. Fourteen States from the Near East region participated in this Commission. Dr Ahmed Osman, ICARDA-APRP Rangeland and Pasture Specialist, represented ICARDA.
- ❖ ***The 27th Session of the FAO Near East Regional Conference*** was held in Doha, Qatar, on 13-17 March 2004. Topics included: the World Food Summit—five years later; towards improved water demand management in the Near East; food safety and international trade in the Near East region; and establishment of an animal health commission for the Near East and North Africa (AHCNENA).
- ❖ The above meeting was followed by the ***Ministerial Meeting*** on 16-17 March 2004 (Ministers of Agriculture). Dr Adel Abu Nagga, ICARDA Senior Advisor, and Dr Ahmed T. Moustafa, ICARDA-APRP Regional Coordinator, represented ICARDA in these meetings.
- ❖ ***“Ecosystem-based IPM for Date Palm in the Gulf Countries”*** was the title of the date palm regional workshop organized by Al Ain University in collaboration with the Food and Agriculture Organization (FAO) and the Arab Organization for Agricultural Development (AOAD) and held at Al-Ain Hilton on 28-30 March 2004. Dr Ahmed T. Moustafa, ICARDA-APRP Regional Coordinator, represented ICARDA in this meeting.
- ❖ ***The First Plant Nutrition Business Seminar for the Middle East*** was sponsored by 3 fertilizer companies ADFERD, SQM and YARA from 29 March to 1 April in Abu Dhabi, UAE. Over 40 countries sent representatives to the meeting. During the meeting 22 presentations were given. ICARDA was represented by Dr Ahmed Osman, Range and Pasture Specialist, who gave a lecture titled “The Role of Fertilizers in the Dry Areas: the ICARDA Experience.”
- ❖ ***The 3rd Symposium on Scientific Research Outlook in the Arab World (SRO)*** was held in Riyadh from 4 to 7 April 2004. The Symposium was organized by the Arab Science and Technology Foundation and the King Abdulaziz City for Science and Technology (KACST). Dr Habib Halila, Nile Valley and Red Sea Regional Program Coordinator; Dr Samir El-Sebae Ahmed, Head of Human Resources Development Unit; and Dr Ahmed E.

Osman, APRP Pasture and Range Specialist, represented ICARDA in the Symposium.

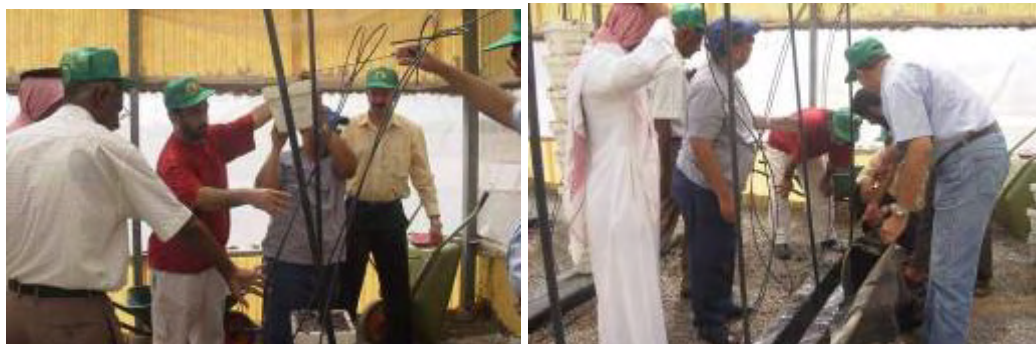
- ❖ An ICARDA mission visited Sana'a, Yemen from 14 to 18 August to discuss and follow up the USAID/Yemen Research project. This mission was headed by Dr Ahmed Moustafa and included Dr Kamil Shadeed and Dr Ahmed Mazid from ICARDA-HQ. The mission contributed to the development of a project document "Food Security and Poverty Reduction through Improved Agricultural Productivity in Rural Communities in Yemen" which was later presented to USAID. The project is to be managed by ICARDA in collaboration with the Agricultural Research Authority (ARA) and Extension Department of the Ministry of Agriculture and Irrigation in Yemen
- ❖ **Organic farming system workshop** was organized by the Ministry of Agriculture and Fisheries 4-5 October 2004 at Abu Dhabi, UAE. Dr Ahmed Osman participated in the workshop and represented ICARDA.
- ❖ **International Conference on Water Resources and Arid Environment** was organized by King Saud University during 4-7 December 2004 in Riyadh, KSA. Dr Ahmed Moustafa attended as key-note speaker who made a presentation titled: "Hydroponics Techniques offer More Crops per Drop."
- ❖ **Production of High Quality Cash Crops in Soilless Culture** was the title of the seminar that Dr Ahmed T. Moustafa, ICARDA-APRP Regional Coordinator gave, at the Ministry of Municipalities Affairs and Agriculture, Bahrain, on 8 December 2004. Discussions followed the seminar on the benefit of Soilless Culture and water saving in the AP region. About 35 researchers, extension agents and growers participated in the Seminar.
- ❖ **American-Yemeni Agricultural Cooperation Workshop** was organized by USAID, Yemen, in Sana'a on 3 October 2004. The workshop was inaugurated by: H.E. Hasan Omar Swied, Minister of Agriculture and Irrigation and H.E. Thomas Krajewski, US Ambassador in Yemen. Different organizations and institutions were present. These included: USAID; ICARDA; New Mexico State University (NMSU); Associates in Rural Development Inc (ARD); Ministry of Agriculture and Irrigation (MAI); Agricultural Research Authority (ARA); Ministry of Planning and International Cooperation, the Public Works Project, Agricultural Cooperative Union, University Faculties of Agriculture, FAO and AOAD. Five presentations were given by the USAID, MAI, ICARDA, ARD, and New Mexico State University. ICARDA was represented by Dr William Erskine; Dr Habib Halila (NVRSP Coordinator); Dr Ahmed Moustafa (APRP Coordinator); and Dr Kamel Shideed.



Capacity Building and Training

- ❖ An on-the-job training was held 9-14 October 2004 by APRP in collaboration with

Rumais Agriculture Research Center in Oman. Five researchers from Bahrain and Saudi Arabia were trained on vertical growing systems of protected agriculture.



- ❖ A 2-month training course on protected agriculture was held during March-May for two Yemeni researchers in Qatar.
- ❖ Another 2-month course was conducted (starting November 2004) for two more Yemeni researchers in Muscat, Oman.



- ❖ A 2-day training course on maintenance and operation of a seed technology unit was held by APRP in collaboration with the Ministry of Agriculture and Fisheries, for one Omani researcher at Dhaid, UAE during September 2004.
- ❖ A training course on Development of Project Proposals, Scientific Writing and Data Presentation was organized by ICARDA-APRP in collaboration with Ministry of Agriculture and Fisheries (MAF), United Arab Emirates (UAE). The course which was held 8-11 January 2005 at Sharjah Rotana Hotel was attended by 15 researchers and scientists from different Arabian Peninsula countries.





- ❖ A special training course on soilless culture was organized by ICARDA-APRP in collaboration of Ain Shams University in Cairo, Egypt, on 25-29 February 2005. A total of 15 participants from different AP countries participated in the course.



Publications

- ❖ Al Hariri, G. 2004. *Evaluation and Restructuring of Agricultural Research Systems in the GCC Countries*. ICARDA-APRP, Dubai, UAE. pp.56.
- ❖ ICARDA-APEP. 2004. *Date Palm: information and figures*. Pamphlet.
- ❖ Date Palm Development in the Gulf Cooperation Council Countries of the Arabian Peninsula. In: Moustafa, A.T., Osman, A. E and Lashine, Z. E.(Eds), *Summary Proceedings of a regional workshop 29-31 May 2004*, Abu Dhabi, UAE. ix + 63 pp.
- ❖ Ahmed T. Moustafa. 2004. Hydroponics Techniques offer More Crops per Drop. In: *proceedings of the International Conference on Water Resources and Arid Environment*, King Saud University, 4-8 December 2004, Riyadh, KSA.
- Ahmed E. Osman, Ahmed T. Moustafa, Arash Nejatian, Medi Layth. 2004. In: *proceedings of Organic Farming. Organic farming system Seminar*, 4th to 5th October 2004 at Abu Dhabi, UAE.
- Ahmed E. Osman. 2004. *Field Guide for Forage Production of Indigenous Lebid Grass*.

ICARDA-Dubai, United Arab Emirates.



Participants from AP countries in ICARDA Training Courses

Year 2003

Headquarters Short-term Training Courses

Management of Water Resources and Improvement of Water-use Efficiency in the Dry Areas/NRMP

(5 May-12 June 2003)

Mahmmad Al-Ghobar /Yemen

Scientific Writing and Data Presentation/CODIS (8-12 June 2003)

Awadh Salman Basaleh/Yemen

DNA Molecular Marker Techniques for Crop Improvement/GP (07-18 September 2003)

Saif Ali Salim Al-Khamisi/S. Oman

Electronic Document Management and the Use of WebAGRIS Tools for Database Management on the Web)/CODIS (30 Nov.-16 Dec. 2003)

Salima Saeed Semba/UAE *

Non-headquarters Short-term Training Courses

Regional Training Workshop on Participatory Research Methods and Community Approach and Characterization

(29 April - 6 May 2003) held in Cairo, Egypt

Abdo Abdullah Naji Al-Thuris/Yemen

Ali Karamah Ben Hadjeh/Yemen

Utilization of Expert Systems in Agricultural Research and Production/HRDU (11-22 October 2003) held in CIAES, Cairo, Egypt

Abdullah Ali Al-Hendi/S. Arabia

Ahmed Mohamed S. Al Manbhari/S. Oman

Mohamed S. Al-Mussali/Yemen

Individual Non-Degree

Germplasm Program

Mansour Nasser Al-Aqil/Yemen	Plant breeding and genetics	5-19 July &
	DNA molecular marker tech for crop imp	13-16 July

Natural Resources Management Program

Abdullah Nassr Al Saadi/Yemen	Administration & finance of Research station	09-23 Jan.
Khaled Mohamed Al Mutawakel/Yemen	Administration & finance of Research station	09 –23 Jan.
Ibrahim Mohammed Moharram/Yemen	Administration & finance of Research station	09-23 Jan.

APRP

Fouad Nour Al-Deen Hasan/Yemen	Green houses management	1 June-30 Aug.
Hasan Mohamed Ahmed/Yemen	Green houses management	1 June-30 Aug.

Individual Degree 2003

Germplasm Program

Hamad A. Salman/UAE	Glasgow Univ.PhD	1997-2003
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Through Cairo office

Hamid Al-Khader/Yemen	Gezira Univ.MSc	Apr. 2001-2003
Ali Ahmed Meghesh/Yemen	Baghdad Univ.MSc	2000-2003

Year 2004

Headquarters Short-term Training Courses

Design and Analysis of Field Experiments/CBSU (15-26 Feb. 2004)

Sadiq Isa Mansoor/Bahrain
Eiman Mansoury/Kuwait *
Ali Shambah Shadad/UAE

Management of Water Resources and Improvement Water Use-Efficiency/NRMP (May 03- Jun 10. 2004)

Hussien Ali Ahmed Al-Washiey/Yemen

Integrated Pest Management of Cereals and Legumes Crops /G.P (09-15 May 2004)

Rashad Hamood Ahmad Basha/Yemen
Abdullah Mohammed Muharram/Yemen

Experimental Station Operation Management/ST.Op. (03-14 Oct. 2004)

Hamed Sulaiman Ali Al-Dhuhli/Oman
Saeed Salem Al-Hameli/UAE

Utilization of Expert Systems in Agricultural Research and Production /HRDU (04-14 October 2004), Sponsored by: ICARDA/CLAES

Ahmed Kulaib/UAE
Fadhli Haidara Mutlaq/Yemen

Non-Headquarters Short-term Training Courses

Soilless Culture, Irrigation and Fertigation Management in Protected Agriculture, Cairo, Egypt, 25-29 January 2005

Mr Salim Mohamed Al Makhmmari	Oman
Mr Muthir Saleh Al Rawahi	Oman
Mr Hani Abdullah Asqit	Saudi
Mr Saud Abdul Aziz Al Eyyed	Saudi
Eng. Rashed Ahmed Ali Saeed Al Hantobi	U.A.E
Eng. Ahmed Mohamed Ali	U.A.E
Mr Aqeel Hassan Hearai	Bahrain
Mr Isam Mustafa Abdel Razaq	Bahrain
Mr Awad Abdo Al Sadi	Qatar

Mr Hadi Abdulla Mohammed	Qatar
Mr Wajeeh Abdullah Al Motawakel	Yemen
Mr Amin Abdo Hassan Al Kirshi	Yemen

Development of Project Proposals, Scientific Writing and Data Presentation, APRP-Sharjah, United Arab Emirates, 8-11 Jan 2005

Mr Rashid Hamdan Al shidi	Oman
Ms Fatma Shamurid Al Raisi	Oman
Mr Abdulaziz Abdullah Alotay	Saudi
Mr Khalid Abdulla Al Zeir	Saudi
Mr Abdullah M. AL Shankiti	Saudi
Mr Salim Fareed Mohamed Akram	U.A.E
Mr Mohamed Abdel Rahim Al Zarouni	U.A.E
Mr Mohamed Rashid Suliman Al Naqbi	U.A.E
Mr Salah Abdullah Mousa	U.A.E
Mr Saleh Radhi Ahmad	Bahrain
Mr Hassan Adam Qaher	Bahrain
Mr Ali Zaid Nasser Al Jammn Al Dosari	Qatar
Mr Naif Mohamed Rashed Ali Rodah	Qatar
Dr Khader Balem Atroosh	Yemen
Dr Khalil Mansoor Al- Shargabi	Yemen

Individual Non-degree

Course subject

Germplasm Program

Salem Mohammed Assaggaff/Yemen	Rust-Epidemics-Monitoring
Mohamed Abdo Mohamed Al-Hakimi/Yemen	Screening for stress tolerance (drought)

Arabian Peninsula

Name 1/Yemen	Green House Management	20 Nov. 04-
Name 2/Yemen	Green House Management	20 Jan. 05

Individual Degree 2004

	<u>Univ.</u>	<u>Level</u>	<u>Period</u>
<u>Germplasm Program</u>			
Hamad A. Salman/UAE	Glasgow Univ.	PhD	1997-2004
Adel Ghani Lutf Al Ansi/Yemen	Aleppo Univ.	PhD	2004-
Through Cairo office			
Hamid Al-Khader/Yemen	Gezira Univ.	MSc	Apr. 2001-2003