



International Center for
Biosaline Agriculture



ICBA

ANNUAL REPORT
1420/1421 H YEAR 2000

About ICBA

The International Center for Biosaline Agriculture (ICBA) is an applied research and development (R & D) Center located at Dubai, UAE. The Center was established with financial support from the Islamic Development Bank (IDB) and additional support from the OPEC Fund for International Development, the Arab Fund for Economic and Social Development (AFESD), the Dubai Municipality and the Government of the United Arab Emirates. The construction of the facilities commenced in 1997 and was completed in 1999. The Center began operations in September 1999. ICBA's objective is to develop and promote the use of sustainable agricultural systems that use saline water to grow forages, field crops, vegetables, fruits and trees. The Center does not intend to duplicate work already done by scientific institutes in salinity research, but act as a focal point for technology development and genetic resource exchange for geographical areas facing problems of salinity and depletion of scarce fresh water. It is expected that the technologies the Center develops will be of a global value and will help farmers facing problems of saline soils or salt water irrigation to improve their production of food and feed in a sustainable manner.

ICBA is initially focusing on problems faced by countries of the Gulf Co-operation Council, followed by other Islamic countries as well as other parts of the world grappling with increasing saline conditions.

The Center is unique in having modern, sophisticated facilities dedicated solely to the development of saline agriculture. It has also recruited renowned scientists working in various disciplines of saline agriculture to implement its R & D Program. The Center is mobilizing its resources to become a 'center of excellence' in the field of biosaline agriculture and intends to serve its clientele across the world.



Contents

<i>Preface (Chairman of the Board of Trustees)</i>	2
<i>Foreword (Chairman of the Board of Directors)</i>	3
<i>Board of Trustees</i>	4
<i>Board of Directors</i>	7

Section I

Highlights of Technical Programs

<i>Development of Infrastructure</i>	9
<i>Research and Development</i>	10
- <i>Preparation of ICBA's Strategic Plan (2000 - 2004)</i>	10
- <i>Projects</i>	11
<i>Communication, Information and Networking</i>	19
- <i>Communication and Information</i>	19
- <i>Scientific and Annual Meetings</i>	21
- <i>Publications</i>	22
<i>Training, Workshops and Conferences</i>	22

Section II

Highlights of Administration and Finance Services

<i>Administration</i>	25
- <i>Policies and Procedures</i>	25
- <i>Organizational Chart</i>	26
- <i>Staff Recruitment</i>	26
- <i>Computer Services</i>	26
<i>Finance</i>	27
- <i>External Audit Report 1999</i>	27
- <i>Statement of Budget and Actual Expenses</i>	27
- <i>Resources Mobilization</i>	27

Appendixes

<i>Summary of Weather Information at ICBA Station</i>	30
<i>Agreements</i>	32
<i>Visitors at ICBA</i>	33
<i>Organizational Structure</i>	35
<i>Statement of Budget and Actual Expenses</i>	36
<i>Core Staff</i>	37
<i>Acronyms</i>	38

Preface

Preface

The Islamic Development Bank (IDB) is an international financial institution established in 1975, (corresponding to 1395 Hejra). The purpose of the bank is to foster the economic development and social progress of member countries and Muslim communities in non-member countries. The bank is also charged with the responsibility of providing technical assistance to member countries and extending training facilities for personnel engaged in development activities.

As part of its technical assistance program IDB took an initiative in 1989 to promote the use of saline water for agriculture due to an alarming rate of depletion of limited fresh water resources in the Gulf region and arid zones in general. An international Scientific Committee commissioned by the bank studied the problem in depth and endorsed the concept of biosaline agriculture. It further recommended establishing a Center in the region to fully exploit this option.

The concept of biosaline agriculture came to fruition in 1996 with the signing of an agreement between IDB and the Government of the UAE to establish this Center in the UAE, with headquarters in Al-Ruwayya, Dubai. IDB collaborated with other sister organizations (Arab Fund for Economic and Social Development, OPEC Fund, Ministry of Agriculture and Fisheries, Dubai Municipality and others) to ensure the establishment of a world-class facility. As a result of the hard work and dedication of the staff of IDB, the host country, members of technical and advisory committees and many others, the Center was completed in late 1999. It commenced operation in September 1999 with a clear vision and strategic direction to serve its clients in the member countries. Initially, ICBA will direct its attention to the GCC countries, followed by other countries of similar eco-climatic zones.

IDB has been and still is providing financial support for ICBA to achieve its goals and mission. It is our hope that the Center will play an active role in the Research and Development (R & D) of biosaline agriculture and that it will succeed in developing appropriate technological packages for sustainable agricultural production under the adverse environmental conditions of saline irrigation water. We are confident in IDB that this flagship will reach out to serve our member countries and humanity at large. We ask all sister organizations and member countries to provide all the needed support to this young Center to enable it to move forward and achieve the desired results.

Last but not least, I would like to re-iterate IDB's appreciation and gratitude for the host country (United Arab Emirates) for all the help and support it is providing for ICBA. Without this support and encouragement it would not have been possible for the Center to implement its R & D Program. I am confident that they will continue to assist ICBA in the coming years.

**Dr. Ahmad Mohamed Ali,
President, Islamic Development Bank, and
Chairman, Board of Trustees, ICBA**



Foreword

Foreword

The International Center for Biosaline Agriculture (ICBA) is a new addition to the group of national, regional and international R & D organizations dedicated to protecting and managing natural resources and increasing production of food and feed. ICBA started its operations in September 1999 with the prime objective of promoting the use of saline water to irrigate forages, crops, ornamental plants and horticultural crops as well as trees. The Center aims to emerge as a 'center of excellence' in technology development and genetic resource exchange of biosaline agriculture. Clearly this is quite a challenge for a relatively small organization but ICBA feels confident that with its committed management and scientists it will be able to achieve its mission.

This is ICBA's first Annual Report for the year 2000. It has two major sections:

- *Highlights of Technical Programs*
- *Highlights of Administration and Finance Services*

It is evident from the achievements described here that ICBA has made significant progress in its planned activities. More importantly, in this short period the Center has succeeded in finding its 'niche' among well established R & D organizations and is gradually being recognized among its peers as a promising international Center working on an important new frontier in agriculture. We feel proud of this modest achievement. We are also proud of the partnerships we have now forged with many national, regional and international organizations and institutions. We are convinced that the only way to make a significant difference in what we are trying to achieve is through collaboration and working together with others in a spirit of partnership.

I welcome your comments and suggestions for improvement of our future reports. ICBA is in a learning phase and would like to benefit from our sister organizations to do a better job to fulfill our mandate and mission.

Dr. Mohammad Al-Attar,
Chairman, Board of Directors, and
Director General



Members of the Board of Trustees

Members of the Board of Trustees

Chairman

*Dr. Ahmad Mohamed Ali,
President, IDB and Chairman,
Board of Executive Directors,
PO Box 5925, Jeddah 21432, Saudi Arabia
Tel. + 966 2 6361400
Fax. + 966 2 6366871*

Members

*Hon. Mutahar Abdul-Aziz Al Abbasi,
Executive Director, IDB
Ministry of Planning and Development,
Sana'a, Republic of Yemen
Tel. + 967 1 250 114
Fax. + 967 1 250 120*

*Hon. Faisal Abdul Aziz Al-Zamil,
Executive Director, IDB
P.O. Box 28738, Safat 13148, Kuwait
Tel. + 965 2403847 - 2403890
Fax. + 965 2513900*

*Hon. Zoumana Camara,
Executive Director, IDB
Direction Générale de la Dette Publique
Bamako, République du Mali, B.P E4885
Tel. + 223 224658/222935
Fax. + 223 220793*

*Hon. Mamadou Cherif Diallo,
Executive Director, IDB
B.P. 4794
324 Rue-Ro - 120, Conakry, Taouyah,
Republique of Guinea
Tel. + 224 415430
Fax. + 224 415430*



Members of the Board of Trustees

Hon. Jamal Nasser Rashid Lootah,

Executive Director, IDB

Assistant Undersecretary for Properties and Purchases,

Ministry of Finance and Industries,

P.O. Box 433, Abu Dhabi, UAE

Tel. + 971 2 6723225 (Abu Dhabi), + 971 4 3937444 (Dubai)

Fax. + 971 2 6746748 (Abu Dhabi), + 971 4 3937877 (Dubai)

Hon. Mohammad Azzaroog Rajab,

Executive Director, IDB

Chairman and General Manager,

Development Bank, Tripoli,

Socialist People's Libyan Arab Jamahiriyah

Telex + 20193

Fax. + 21821 4802045/46 - 3606197

Hon. MD. Sayef Uddin,

Executive Director, IDB

Joint Secretary,

Economic Relations Division, Ministry of Finance,

Block # 16, Room # 14, Sher-e-Bangla Nagar,

Dhaka, Bangladesh

Tel. + 880 2 814292

Fax. + 880 2 813088/811660/8113088

Hon. Ismail Zaghoul,

Executive Director, IDB

Controller General and Deputy Head for Research Department,

Central Bank of Jordan,

P.O. Box 27, Amman 11118,

Hashemite Kingdom of Jordan

Tel. + 9626 46 30 301

Fax. + 9626 46 22 149

Hon. Zeinhom Zahran,

Executive Director, IDB

Undersecretary for the Ministry of Finance,

Cairo, Egypt

Tel. + 202 7943201/7957994

Fax. + 202 7957994

Listed alphabetically



Members of the Board of Trustees

*Hon. Dr. Abdullah bin Ibrahim El-Kuwaiz,
Executive Director, IDB,
General Manager,
Gulf International Bank,
P.O. Box 1017, Manama, Bahrain
Tel. + 973 534000 - 522445
Fax. + 973 522633 - 522644*

*Hon. Dr. Morteza Gharehbaghian,
Executive Director, IDB
Vice Minister for Banking and Insurance Affairs,
Ministry of Economic Affairs and Finance,
Nasser Khosrow Avenue, Tehran
Islamic Republic of Iran
Tel. + 9821 2581 931-32
Fax. + 9821 2581 933*

*Hon. Haji Khalid Bin Haji Ghazali,
Executive Director, IDB
No. 7-528 Kampong SG Hunching,
Jalan Muara, Brunei Darussalam
Tel. + 673 2 235321
Fax. + 673 2 235322*

*Hon. Ilgar Veysal Oglu Isayev,
Executive Director, IDB
83.8 Vurgun Street, Baku City - 370022,
Azerbaijan Republic
Tel. + 994 12 930743
Fax. + 994 12 402968/985381*

*Hon. Tarik Kivanc,
Executive Director, IDB
Rafel Cannez Cad, Orman Api No. 7 - 10,
Ankara, Turkey
Tel. + 90 312 491 0655
Fax. + 90 312 491 0655*



Section I

Highlights of Technical Program



high salinity wa

Members of the Board of Directors

Members of the Board of Directors

Chairman

Dr. Mohammad H. Al-Attar

Director General

International Center for Biosaline Agriculture

P.O. Box 14660, Dubai, UAE

Tel. +971 4 3361100/3363158, Fax. +971 4 3361155/3363159

Members

Dr. Mahmoud A. Al Affifi

Professor of Soil Science

UAE University, P.O. Box 17555, Al Ain, UAE

Tel. +971 3 7051249/7635647, Fax. +971 3 7612621/7632384

Eng. Mohamed Sager Al-Asam

Assistant Undersecretary for Water and Soil

Ministry of Agriculture and Fisheries

P.O. Box 1509, Dubai, UAE

Tel. +971 4 2957216/2950136, Fax. +971 4 2957204

Eng. Essa Al Maidoor

Director, Drainage and Irrigation Department

Dubai Municipality, P.O. Box 67, Dubai, UAE

Tel. +971 4 2063600/2287707, Fax. +971 4 2214835

Dr. Mohammed Al-Suwaiyel

Vice President for Research Institutes

King Abdul Aziz City for Science and Technology

Riyadh, Saudi Arabia

Tel. +966 1 4811567, Fax. +966 1 4883756

Eng. Rashid K. Al-Shariqi

Deputy Minister

Ministry of Agriculture and Fisheries

P.O. Box 1509, Dubai, UAE

Tel. +971 4 2959808, Fax. +971 4 2958525

Dr. S.H. Mujtaba Naqvi

27-B North Circular Avenue

Defense Housing Society

Karachi, Pakistan

Tel. +92 21 538 4391, Fax. +92 21 454 6152



Listed alphabetically

Technical Programs

Technical Programs Division

During the year 2000, ICBA's Technical Programs made good progress in four key sectors.

1. Development of Infrastructure
2. Research and Development
3. Communication, Information and Networking
4. Training, Workshops and Conferences

The highlights of the progress made in each of these areas during the year 2000 follow.

These summaries are not a complete account of the work begun or completed during the year, rather, they describe some key achievements made in each group of activities. The summaries provide the reader with some insights into the breadth of the activities undertaken by this young Center in its first year of operations. It should also be noted that most of the technical staff joined in the second half of the year 2000 and most of the fieldwork began in November 2000. Nevertheless, ICBA has made significant progress towards its goals and objectives.

1. Development of Infrastructure

As a new organization that started its operation in September 1999, ICBA put priorities in developing its infrastructure to support the proposed research and development activities. The main achievements follow:

- *Expansion of the Irrigation Network:* Following the receipt of funds from the OPEC Fund for International Development for expansion of ICBA's irrigation system, ICBA put the work out for tender and the contract was awarded in August 2000. The work involved construction of a high salinity pump station, installation of a computerized control system and laying of irrigation sub-main and lateral lines. This project commenced in early September and was completed by the end of November.



High salinity water pump station in operation

Technical Programs

• **Maintenance of Existing System:** The irrigation network for four hectares was maintained and prepared for the next growing season. Sprinkler heads were serviced and leaky drip laterals replaced. A traveling irrigator was installed. The weather station was dismantled and all sensors were serviced. A new relative humidity sensor was also installed.



UV-visible spectrophotometer



Atomic absorption spectrophotometer

• **Equipment:** Various equipments were ordered and some have already been received. This included an EM-38 electrical conductivity meter, an atomic absorption spectrophotometer, a UV-visible spectrophotometer, a Kjeldahl digestion/distillation unit, a leaf-area meter, a seed counter, a seed sampler, an infrared thermometer and a furnace. The support staff is currently being trained in the use of these equipments.

• **Modification of Genebank:** Work was completed for the modification of the medium-term facility to serve as temporary short-term genebank for storage of germplasm. Presently, both temperature and humidity are within the norms specified for this facility.

2. Research and Development

2.1 Preparation of ICBA's Strategic Plan (2000-2004)

The Strategic Plan (2000-2004) of ICBA was developed and sent to the relevant ministries and technical organizations in the Gulf region, Islamic countries and other stakeholders. Most organizations provided valuable input and remarks, which were incorporated in the modified version before submission to the Board of Directors in May



Genebank

2000. The Board approved the Plan, subject to revision and modifications. ICBA further reviewed the document and steps are currently being taken to produce the final document in early May 2001. It will then be distributed to all concerned organizations and ministries.

2.2 Projects

The staff of the Technical Programs prepared seven projects. These projects were jointly prepared and are being jointly implemented with other sister organizations such as the International Center for Agricultural Research in the Dry Areas (ICARDA), the Ministry of Agriculture and Fisheries (MAF) and the International Atomic Energy Agency (IAEA). Thus the scope and priorities of our project portfolio are determined by practical realism. ICBA also has taken a proactive approach in developing and implementing small in-house projects to provide the impetus for future large-scale projects with external financial support.

A summary of these seven projects and highlights of the progress made during the year 2000 follow.

Project 1: Plant Training and Water Management for Establishment of Windbreak Plants in Shallow Water Table Areas (Continuation)

Objectives:

1. To replicate the natural conditions that would enable indigenous plants to grow in arid environments with minimal water application.
2. To develop a water management scheme that will encourage indigenous plants to tap into shallow water table sources.
3. To develop a demonstration pilot project where indigenous plants can grow without any external water application.



Genetic accessions with deep-roots



Transplanting a deep-rooted plant

Project's Progress:

Three tree species, *Prosopis tamarugo*, *Acacia arabica* and *Leucaena leucocephala* were grown for eight weeks in plastic tubes each having a length of 1.5 m and a diameter of 5 cm. During October and November 2000, seventy-two plants were transplanted into the field in deep auger holes. The plants are surviving with no external water application and with only 7% mortality. The experiment continues.



Technical Programs

Project 2: Mass Screening of Halophytes

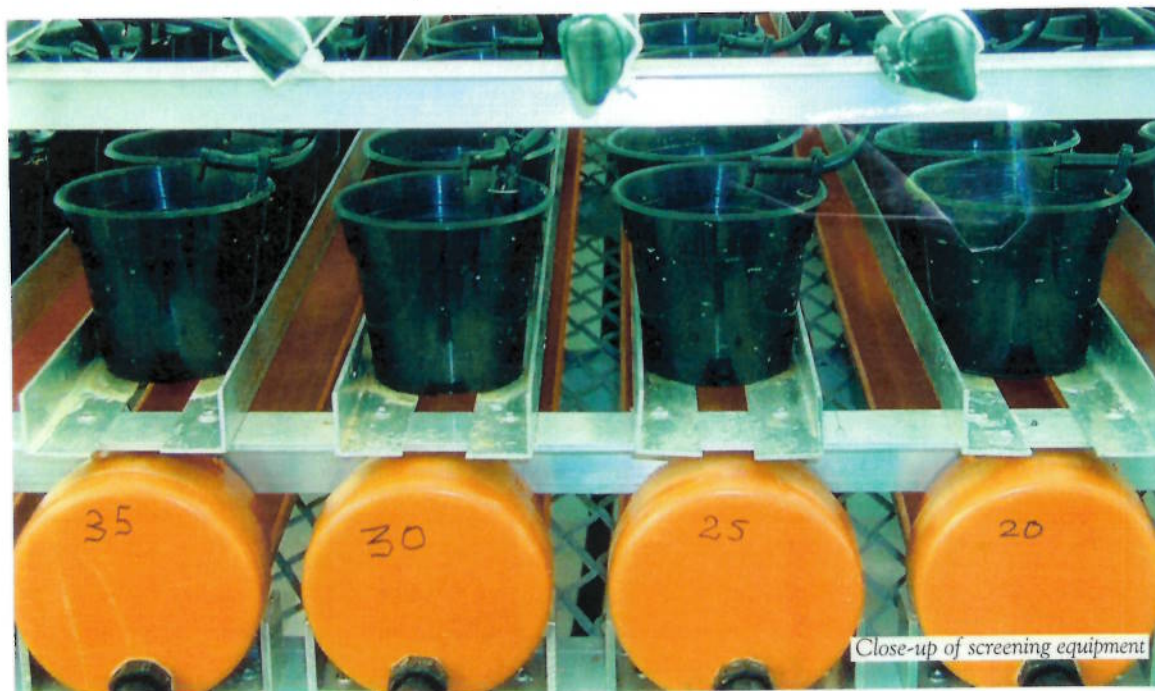
Objectives:

1. To conduct rapid screening of halophytic and salt-tolerant germplasm for greenhouse and field trials.
2. To identify germplasm with desirable characteristics for field experiments.



Project's Progress:

This screening procedure of species/accessions takes 6-8 weeks depending upon the species/accessions being tested. With the present set-up that is being designed, each cycle can test 30 species/accessions at a time depending upon the group of plants. This screening procedure of species/accessions will take 4-8 weeks depending upon the species/accessions being tested. The experiment continues.



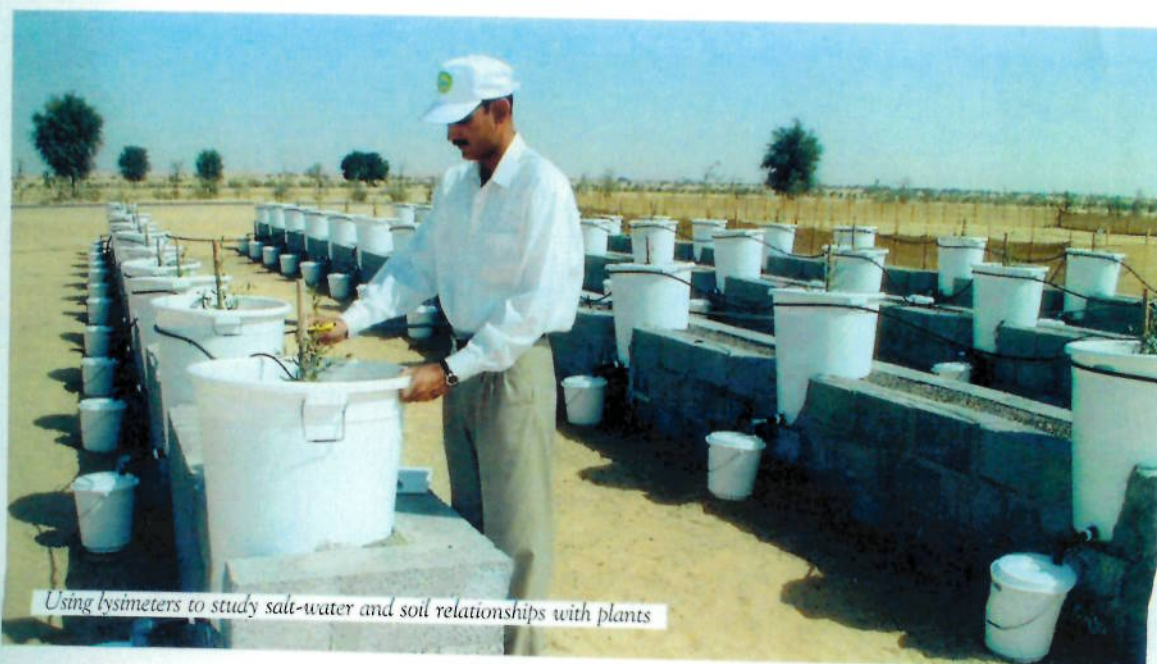
Project 3: Studies on Water Use and Salt Balance of Halophytic Species

Objectives:

1. To develop management techniques to improve productivity of promising halophytic species for forage. Productivity of plant genotypes exhibiting salt tolerance to be tested in lysimeters under different managements.
2. To study the effects of water quality/quantity on these species affecting harvest period and frequency, and their nutritional aspects for optimizing productivity.

Project's Progress:

Lysimeters were locally fabricated from plastic drums each having a capacity of 125 L. Each lysimeter is fitted with a drainage outlet to collect the drainage water for analysis of quantity and quality. The basal portion of the lysimeters are filled with gravel for proper drainage and then filled with sandy soil. A total of 48 such lysimeters were prepared. These lysimeters are being used for studying salt-water budgeting, soil moisture variations and salt movements in reference to growth and productivity. The present experiment investigates growth of seedlings of *Salvadora persica*. Initial observations have been taken and the data are being entered into the database.



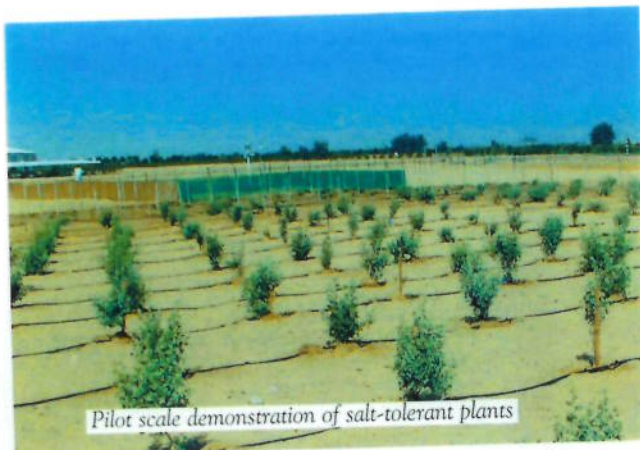
Using lysimeters to study salt-water and soil relationships with plants

Project 4: Sustainable Utilization of Saline Groundwater for Plant Production under Rangeland Conditions - In collaboration with IAEA and MAF

Objectives:

To demonstrate the value of saline water and salt-affected lands in producing economically viable agriculture. Specifically:

1. To conduct pilot scale demonstration and studies on utilization of salt-affected lands and different qualities of water (fresh and saline) for growing salt-tolerant plant species (grasses, trees and bushes).
2. To apply nuclear techniques in the management of irrigation, other farming practices and salt balance in the soil and aquifer and for monitoring the soil for its physical, chemical and biological status before and after introduction of plants.
3. To demonstrate the favorable effects of plant growth on soil fertility and productivity.



Pilot scale demonstration of salt-tolerant plants

Project's Progress:

Seeds of *Atriplex lentiformis* and *A. canescens* have been seeded in plots of 24 x 24 m with an inter-seeding distance of 2 m. Five-week-old seedlings of *Leucaena leucocephala* and *Salvadora persica* were also transplanted in 24 x 24 m plots 3-apart. The plots are being irrigated with low-salinity water.

Four plots of 24 x 55 m have also been seeded with *Hordeum vulgare* (cv. Dicator), *Avena sativa*, *Medicago* spp. (Medic) and *Medicago sativa* (Lucerne) @ 17, 25, 8 and 3.5 KG/ha, respectively. The seedbeds would be irrigated with a traveling irrigator at a speed of 24 M/hr and a flow of 150 L/min.

Seeds of *Atriplex lentiformis* and *A. canescens* have started germinating and their data are being recorded. Seedlings of *Leucaena leucocephala* and *Salvadora persica* have also established. Nursery seedlings of the germplasm provided by IAEA showed good germination. They were transplanted to the field and are being monitored.

Project 5: Evaluation of Irrigation Practices and Fertilizer Requirements for Optimizing Productivity of Three Indigenous Grass Species - In collaboration with ICARDA-APRP

Objectives:

1. To evaluate water-use efficiency, salinity tolerance, and fertilizer requirements of *Coelachyrum piercei*, *Cenchrus ciliaris*, and *Lasiurus scindicus*.
2. To determine the appropriate irrigation system and irrigation management practices of the above species.



Project's Progress:

These experiments have been designed in a factorial design using three grass species (*Cenchrus ciliaris*, *Coelachyrum piercei*, and *Chloris gayana*). *Lasiurus scindicus* has been replaced with *Chloris gayana* because adequate amounts of seeds were not available and the season was not suitable for its germination. Seeds have been planted in nine different plots of 25 x 25 m, each with plot having seeds of all the three species in four sub-plots replicates. The nine different plots will be irrigated with three salinity levels (3,500, 7,000 and 10,500 ppm) and three irrigation treatments.



Seeding has been completed, the young seedlings have started emerging and their germination data in each of the plots, sub-plots and number of points in each sub-plots are being recorded and entered into the database.

Project 6: Plant Genetic Resources: Acquisition, Collection and Conservation

Objectives:

1. To establish and develop a plant germplasm repository (genebank) specifically targeted for the acquisition, evaluation, maintenance, and regeneration of halophytes, salt-tolerant plant species or crop species adapted to saline agricultural conditions and used for greening purposes.

Technical Programs

2. To collect, maintain, evaluate, document, and distribute plant genetic resources for use in the Gulf Region, the Islamic countries, and elsewhere.

3. To determine the basis for, and extent of genetic variation and the geographic distribution of salt-tolerant species in the Gulf Region (first phase) and other Islamic countries (second phase).

Project's Progress:



Work continued in acquiring seed from several sources (Australia, Germany, Saudi Arabia, USA, UAE, Oman and international institutes such as ICARDA) of salt-tolerant and potentially salt-tolerant germplasm. Table 1 summarizes the whole collection already received, which is stored in the short-term cold storage room. This collection is being used for planting during the current cropping season. Most accessions acquired are either forage grasses or forage legumes.

Necessary adjustments to the medium-term cold storage room were carried out to accommodate germplasm storage under current conditions. Shelves were constructed to accommodate germplasm samples. All seed samples were placed in glass jars and stored temporarily under 10°C and the prevailing relative humidity. Accessions are being placed on the shelves in alphabetical order and a matching map and database are being developed and computerized.

A laboratory procedure was established to mass screen germplasm of potentially salt-tolerant species at a constant salinity level (15 dS/m). Two germplasm collections (*Sorghum bicolor* and *X. Triticosecale*) were screened in a germinator at 25°C. Seed from accessions of both species that prove to be salt-tolerant will be planted in the field during the next growing season for evaluation of their potential as forage grasses.



Technical Programs

Table 1. Details of species, number of accessions and source of germplasm acquisitions that are stored in the ICBA genebank.

Species	Number of accessions	Source	Nature of crop
<i>Beta vulgaris</i> sp <i>vulgaris</i>	12	Germany	Forage/Sugar
<i>Beta vulgaris</i> sp <i>maritima</i>	38	Germany	Forage
<i>Chenopodium quinoa</i>	121	USA	Grain
<i>Echinochloa</i> sp.	151	USA	Forage
<i>Melilotus alba</i>	239	USA	Forage
<i>Melilotus officinalis</i>	243	USA	Forage
<i>Astragalus</i> sp.	69	USA	Forage
<i>Atriplex</i> sp.	36	USA	Fodder
<i>Cenchrus ciliaris</i>	828	USA	Forage
<i>Chloris gayana</i>	116	USA	Forage
<i>Coelachyrum piercei</i>	1	USA	Forage
<i>Hymenocarpus circinnatus</i>	2	USA	Forage
<i>Lathyrus</i> sp.	254	USA	Forage
<i>Leptochloa malabrica</i>	3	USA	Forage
<i>Leucaena leucocephala</i>	236	USA	Fodder
<i>Lotus</i> sp.	201, 30	USA, ICARDA	Forage
<i>Lupinus</i> sp.	68	USA	Forage/Grain
<i>Maireana brevifolia</i>	1	USA	Forage
<i>Medicago</i> sp.	509, 4	USA, Australia	Forage
<i>Paspalum vaginatum</i>	2	USA	Forage/Turf
<i>Pennisetum purpureum</i>	1	USA	Forage
<i>Sporobolus</i> sp.	20	USA	Forage
<i>Trifolium</i> sp.	101	USA	Forage
<i>Trigonella</i> sp.	13	USA	Forage
Indigenous species	115	UAE	Forage
Indigenous species	71	Oman	Forage
<i>Avena sativa</i>	2	Australia	Forage/Grain
<i>Hordeum vulgare</i>	1	Australia	Forage/Grain
Indigenous species	18	Saudi Arabia	Forage
X. Triticosecale	500	USA	Forage/Grain
<i>Sorghum bicolor</i>	135	USA	Forage/Grain
<i>Echinochloa turneriana</i>	3	Australia	Forage

Project 7: Seed Increase of Salt-tolerant Germplasm

Objectives:

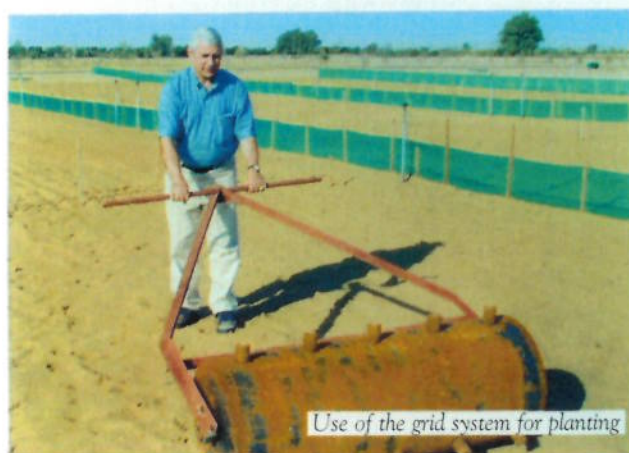
1. To provide improved and salt-tolerant germplasm for the development of forage legumes, forage grasses, fodder shrubs and forage halophytes.
2. To increase, characterize and evaluate salt-tolerant or potentially salt-tolerant forage and fodder germplasm to be used in developing forage/fodder cultivars at ICBA.
3. Characterize and evaluate forage and fodder germplasm for productive traits, and
4. Produce maximum amounts of healthy and viable seed of a selected number of forage species.

Project's Progress:

Random samples from an Omani landrace were tested for their tolerance to increasing levels of salinity (0, 5, 10, 15 and 20 dS/m). The test indicated that 100% germination was maintained at 20 dS/m. However, there was a steady decline in the following characteristics measured or recorded on each sample: number of seminal roots, coleoptile length and seedling dry weight. An earlier selection of 3,030 single heads of barley was characterized and a selection of 1,000 accessions, representing maximum diversity in the whole collection was subjected to a cluster analysis.

A semi-automated procedure was established to plant seed of forage grasses (typically very small seed) in Jiffy-7 medium, grow them in the greenhouse until seedlings reach 10-15 cm in height, transfer seedlings to the shade house for 2-3 days for acclimatization before transplanting them in the field. Approximately 12,000 seedlings were produced using this procedure.

A grid system was developed to plant seedlings at 50 x 25 cm for barley



Use of the grid system for planting

or 50 x 50 cm for other forage grasses (*Cenchrus ciliaris*, *Coelachyrum piercei*, *Lasiurus scindicus*, and *Sporobolus* spp.)

so that plants will have maximum resources to achieve their full genetic potential (i.e., maximum vegetative growth and seed production). Approximately 40,000 barley, 10,000 *Cenchrus ciliaris*, *Coelachyrum piercei*, *Lasiurus scindicus*, and *Sporobolus* spp. seedlings are growing in the field for seed increase and evaluation as forage crops.



3. Communication, Information and Networking

3.1 Communication and Information

- Two issues of *Biosalinity News*, ICBA's newsletter were published in English in February and June. The Arabic version of the newsletter was published in August and December. Copies were circulated to all relevant organizations and institutions. The newsletter was well received by the scientific community.
- Two brochures in English and Arabic regarding ICBA's history, mission, mandate and programs were designed, printed and distributed to all concerned parties.
- ICBA's database of contacts has been developed and is being continuously updated.
- A proposal for an Inter-Islamic Network on Saline Irrigated Agriculture was developed and submitted to H.E. Prof. Atta-ur-Rahman, the Coordinator General of the COMSTECH Secretariat. Professor Atta-ur-Rahman subsequently submitted the proposal to IDB endorsing the document seeking funds for the establishment of the Network.
- A new interactive web site for ICBA (www.biosaline.org) was developed. The site is presently functional and is providing excellent visibility for the Center and its activities. It will be updated to provide continuous information to collaborators and the public. The initial feedback is encouraging.
- A new pop-up exhibition stand for ICBA was also prepared. The 3 x 4 meter stand provides pictorial records of ICBA and has been well received by viewers.
- Posters describing ICBA and its activities were designed and displayed at many local, regional and international conferences and workshops. These promotional materials were helpful in improving the image of ICBA within the scientific community and the public.
- Key journals and an initial collection of seminal books on biosaline agriculture have been ordered and received. Work is currently in progress to equip the library and provide on-line facilities.
- The Director General of ICBA signed three Memoranda of Understanding with the following local, regional and international organizations:
 - The International Center for Agricultural Research in the Dry Areas (ICARDA), Syria
 - Pakistan Agricultural Research Council (PARC), Pakistan
 - Agricultural Research Education and Extension Organization (AREEO), Iran

These MoUs dealt with collaboration in research, technology transfer, training, exchange of documents, scientific information and exchange of scientific and technical staff.

Technical Programs

- The Director General held three coordination meetings with the Ministry of Agriculture and Fisheries, UAE, one with H.E. Saeed Bin Mohammed Al Raqabani, Minister of Agriculture and Fisheries and two with Eng. Rashid M Khalfan Al-Shariqi, Deputy Minister, Ministry of Agriculture and Fisheries. During the meetings the Director General's participation in the GFAR and CGIAR Mid-Term Meeting 2000 at Dresden, Germany was endorsed. It was also



decided that he would represent H.E. the Minister at those meetings; that there was a need to recruit UAE nationals to work at the Center; the requirement for development of a joint proposal with the Ministry of Agriculture and Fisheries on date palm research; and the need for technical assistance from ICBA to the Ministry.

- The Director General headed an ICBA delegation to the Arab Fund for Economic and Social Development (AFESD) in May that sought financial support from AFESD for the completion of ICBA's irrigation system.
- ICBA senior management held successful meetings in October 2000 with the Directors General of international agriculture centers such as ICARDA, ICRISAT, ILCA, ICRAF and ISNAR during the Centers Week 2000 in Washington D.C. They were briefed on ICBA's mandate and mission and our interest to establish linkages and collaborative work. The CGIAR centers welcomed the opportunity to cooperate with ICBA. ICBA staff also visited the George Brown Salinity Lab in Riverside, California, USA, and discussed collaborative work with this world-renowned laboratory. It was agreed to prepare an MoU and identify possible areas for cooperation.
- ICBA's staff also held meetings with the staff of the Environmental Research and Wildlife

Technical Programs

Development Agency (ERWDA) in Abu Dhabi. Specific projects were identified for joint collaborative work. Two proposals have been developed and are currently being finalized.

- ICBA's management and senior staff also met in November 2000 with H.E. Mohammad Bin Fadhil Al Hamli (Under Secretary for Abu Dhabi Municipality and City Planning) and his senior staff. Discussions centered on major agricultural problems in the Abu Dhabi Emirate and ICBA's opportunities to assist in resolving them. It was agreed to form a joint committee to identify joint projects.
- ICBA also established linkages with the International Atomic Energy Agency (IAEA) and is presently executing a project on their behalf in collaboration with the Ministry of Agriculture and Fisheries (MAF) in the UAE. IAEA is providing financial support for the project by providing equipment valued at US\$50,000.

3.2 Scientific and Annual Meetings

Management and staff of ICBA participated in several conferences, exhibitions and annual meetings of relevant organizations and institutions. These are:

- Dubai International Conference on Desertification 2000
- The Second Arab International Conference and Exhibition on Environmental Biotechnology, Abu Dhabi, April 2000
- Fourth Annual Meeting for Animal Production under Arid Conditions, which focused on "Future Perspectives of Salt-Tolerant Plants in the Gulf Region"
- First International Conference on Greenery and Environmental Beautification in Arid Zones, Kuwait.
- Ninth Meeting of the OIC Standing Committee on Scientific and Technological Cooperation (COMSTECH) General Assembly in Islamabad, Pakistan.
- First meeting of IDB's Advisory Panel on Science and Technology, 17th October 2000.
- 25th Annual meeting of the IDB Board of Governors in Beirut, Lebanon, 4-8 November 2000.



3.3 Publications

- Jaradat, A.A. 1999. Plant genetic resources for salt tolerance in the Mediterranean region. June 21-23, 1999. Regional Symposium on Irrigation and Saline Conditions. Jordan University of Science and Technology, Irbid, Jordan. Published by Jordan University of Science and Technology.
- Jaradat, A.A. 2000. Halophytes for sustainable biosaline farming systems in the Middle East. In: Alsharhan, A. S., W. W. Wood, A. Goudie, K. W. Glennie and Abdellatif, E. M. (eds.) Desertification in the third Millennium. In press.
- Jaradat A.A., H.Al Zarooni and H. Shebanah. 2000. How diverse are date-palm varieties in GCC countries? Accepted for presentation in the second International Date Palm Conference, March 25-27, 2000. Al Ain, UAE.
- Hasbini, B. 2001. Biosaline Agriculture: Water Cost and Crop Production. Accepted for presentation at the Water Science and Technology Association 5th Meeting: Doha, Qatar 24-28 March 2001.

4. Training, Workshops and Conferences

One of ICBA's objectives is to train professional personnel on the different aspects of biosaline agriculture. The first training course on "Design and analysis of laboratory and field experiments" was designed and implemented with the following two objectives in mind: (a) to familiarize participants with the concepts of experimental design and analysis, and (b) to enhance the skills of technicians in field and laboratory experimentation and in statistical analysis of the results.

Sixteen trainees from the Ministry of Agriculture and Fisheries, Abu Dhabi Municipality, Dubai Municipality and ICBA participated in the week-long (Sept 16-20, 2000) training course held at ICBA.

Dr. Marian Fuchs-Carsh, a US Consultant, held a 3-day workshop on Preparation of Proposals for Funding Agencies during the month of December, 2000. The workshop was attended by ICBA staff, Ministry of Agriculture and Fisheries and Dubai Municipality.

- The staff of the Technical Programs have designed three training courses/workshops for the year 2001. These course are:

Technical Programs

i Irrigation with Brackish Water. May 2001

The overall objectives are to introduce the concept of irrigation with saline water and to enhance the skills for management of salt-affected farming areas.

ii Propagation and Management of Halophytes for Optimum Production. October 2001

The overall objective is to provide hands on training to technicians and scientists on management of halophytes from seed handling to production and harvesting.

iii Plant Genetic Resource Characterization, Evaluation, Documentation, and Data Management. December 2001

The overall objective is to improve the capabilities of scientists and technicians to conduct the regular gene banks activities in keeping with internationally accepted standards.

• Symposium on 'Prospects of Saline Agriculture in GCC Countries', March 18-20, 2001

Two Committees, an Organizing Committee and a Scientific Committee were constituted to prepare for the Symposium. Key-note speakers were identified and the First Announcement for the Symposium was prepared and distributed to all concerned parties.



Section II

Highlights of
Administration and Finance
Services



Administration and Finance Services

Administration and Finance Services

During the year 2000, ICBA's Administration and Finance Division made significant progress in various areas.

- Policies and procedures were put in place
- An organizational structure was designed
- Critical staff were recruited
- Efforts were made to mobilize resources
- Computer services were established
- External audit was conducted.

1. Administration

1.1 Policies and Procedures

During the year 2000, a number of administrative and financial systems and procedures were developed. Among those are the following:

- Preparation of 20 different administrative and financial forms for use by staff to process various accounting and personnel transactions. Preparation of draft manuals for accounting, finance and purchasing procedures.
- Preparation of a Safety Policy and Procedure Manual.
- Development of staff rules and regulations governing staff conduct, classification, remuneration, conditions of employment, recruitment process and performance management was fully implemented.
- Development of a highly competitive pension scheme for the staff, which is attractive to senior staff members and general service staff. This plan requires a 7.5% contribution from each staff member, while the Center is contributing 15% to the scheme. This plan is in line with pension schemes of international centers and will contribute to staff retention at the Center.

Other activities included establishment of a Physical Planning Task Force, to review and plan the expansion requirements of the Center, which includes modifications to the laboratories, future expansion of the irrigation system, a training building to support the Technical Programs' work.



1.2 Organizational Chart

The organizational structure has been developed to reflect current needs, as well as those anticipated in the first 5 to 10 years. The structure is designed to enable the staff to meet the Center's objectives through its multi-disciplinary approach to the technical work and through sound financial and administrative practices and management of resources. The organization has two major divisions - the Technical Programs and the Finance and Administration, with other positions assigned directly to the Director General's office. There are four major program areas in the Technical Programs Division with research priorities organized into units. The Finance and Administration Division is also subdivided into units. Details of the functions and structure of each division and unit are shown in Appendix IV.

1.3 Staff Recruitment

The Center has managed to attract scientists and support staff of high caliber. It has followed international procedures in giving fair chance to all interested candidates to compete through advertisements in magazines/newspapers, short-listing those with highest rating and after intensive interviews. As a result of these efforts the following internationally hired D and P level staff members joined ICBA

- Prof. Dr. Faisal K. Taha, Director, Technical Programs
- Dr. Shoaib Ismail, Halophyte Agronomist
- Dr. Abdullah Dakheel, Crops and Forage Agronomist

Job offers were also made to the following staff members who accepted to join ICBA in the spring of 2001

- Mr. Jugu Abraham, Donor Relations Specialist
- Mr. Ghassan Sarris, Administration and Finance Officer

The following G-level staff members also joined ICBA

- Mrs. Kafa Al Tamimi, Accountant
- Mr. Waseem Ali, Administrative Assistant - DDG's Office
- Mrs. Shaziya Khan, Administrative Assistant - Finance and Administration
- Mr. Ghazi Al Jabri, Administrative Assistant - Communications
- Mr. Khalil Ur Rahman, Halophytes Technician
- Mr. Mohammad Shahid, Plant Genetic Resources Technician
- Mrs. Rania Al Bezreh, Receptionist

1.4 Computer Services

Of particular importance is the development of the local area network (LAN) as an effective internal communications tool and along with the expansion of the network to the future needs of

the Center including the Center's own website development. To fulfill its role, ICBA will place considerable importance on the use of the electronic system to support its core units. All staff were offered training courses in Microsoft Office software Word, Excel, PowerPoint and Access. The training was based on the skill level of each staff member and it was offered up to the intermediate level for all interested staff members. Additionally, certain staff are being trained to become in-house trainers for future staff.

2. Finance

2.1 External Audit Report for 1999

The first external audit report of ICBA was completed and presented by M/s Arthur Anderson & Co. certifying that the financial records of ICBA are presented fairly, in all material respects. It also certified that the financial position of ICBA as of December 31, 1999, results of its operations and cash flows from 23 June 1996 to 31 December 1999, are in conformity with generally accepted accounting principles. In addition to this excellent report, the Center is pleased that the auditors did not find any internal control weakness in the operating procedures of the Center, both in the financial and administration operations. Audited tables of both income statement and balance sheet are presented in appendixes.

2.2 Statement of Budget and Actual Expenses

The Center for the year ending December 31, 2000 has incurred operating expenses of US\$ 2.358 million as compared to the operating budget million of US\$ 2.765 million, resulting in a net favorable operating variance of US\$ 407,088. The other favorable variance comes from staff loans due for positions planned for in 2000 but were not hired during 2000. Therefore, and in accordance with the Board of Executive Director's resolution, the sum of US\$ 407,088 is restricted for matching funds to support projects with other donors. The increase in depreciation expense over budget is the result of purchases of capital equipment during the year.

2.3 Resources Mobilization

In response to the directive of ICBA's Board of Trustees to develop a Resource Mobilization Strategy Plan for the Center, the Director General took various proactive steps to implement this decision by identifying key stakeholders in international agriculture for partnerships and/or sponsorship to carry out its activities. Simultaneously, the Center embarked on developing its Strategic Plan to achieve a funding level compatible with IDB's approved funds.

ICBA's management and Technical Program Division worked closely with an international consultant with over 25 years experience in resources mobilization and donor support. Following many meetings and extended discussions, it was agreed that ICBA's Resource Mobilization Strategy Plan would have four related objectives:



Administration and Finance Services

- To increase ICBA's current budget of \$3 million per year to \$4 million per year by 2005 with IDB funding remaining at \$1.5 million/yr by the year 2004.
- To ensure that the budget includes a minimum of \$3 million in unrestricted (core) funds throughout the period.
- To steadily attract new donors, so that by 2005 ICBA receives funds from some 10-12 different donors. These donors together will constitute ICBA Donor Support Group.
- To have ICBA's scientists, each producing 2-3 proposals per year for submission to donors.

In common with all other international agricultural centers, a mixture of core and project grants will fund ICBA's work. The intent is to supplement the funds pledged by the Islamic Development Bank (IDB) over the strategy period, with core funds provided by donors in the Gulf region and elsewhere.

Project grants will be sought in a range of sizes from a range of donors. Larger grants will be sought from multilateral and regional donors; smaller grants will be sought from bilateral country donors. In some cases, ICBA may subcontract with others for a small piece of a larger project; this will be as much to establish professional linkages as for the funding levels involved. In-kind contributions, in the form of seconded scientists, facilities and equipment use will also be sought.



Appendixes

Appendixes

Appendix I Summary of Weather Information at ICBA Station

Appendix II Agreements/MoUs

Appendix III Visitors at ICBA

Appendix IV Organizational Structure

Appendix V Statement of Budget and Actual Expenses

Appendix VI Core Staff

Appendix VII Acronyms

Appendix 1

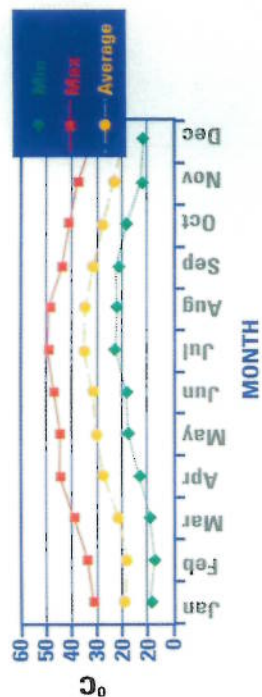
Summary of Weather Information at ICBA Station (Year 2000)

Month	Temperature (°C)			Relative Humidity (%)			Sunshine Hrs	Solar Radiation (W/m ²)			Windspeed (km/hr)			Rainfall (mm)		ETo (mm)			
	Min	Max	Av	Min	Max	Av		Min	Max	Av	Min	Max	Av	Total	Total to Date	Monthly	Total to Date		
Jan	8.1	31.0	18.8	31.6	100.0	83.7	9.9	0	630.0	246.67	262	0	34.3	9.0	6.9	5.4	5.4	38.5	38.5
Feb	6.7	33.4	18.2	31.6	100.0	81.8	9.9	0	701.0	302.28	337	0	39.2	9.0	7.3	5.4	5.4	40.9	79.4
Mar	8.7	38.8	21.2	32.4	100.0	77.6	11.5	0	844.0	364.77	390	0	40.0	10.9	9.2	4.1	9.5	113.6	193.0
Apr	13.4	44.3	27.8	20.0	100.0	65.8	12.1	0	995.0	393.65	426	0	32.0	8.8	7.1	0.0	9.5	103.3	296.3
May	17.6	44.8	30.0	17.0	97.0	67.4	12.3	0	755.0	382.68	417	0	31.2	10.4	8.8	0.0	9.5	238.9	535.2
Jun	18.3	47.0	31.5	21.0	100.0	57.1	12.8	0	844.0	322.60	346	0	30.6	8.8	7.3	0.0	9.5	202.1	737.3
Jul	23.2	49.4	35.3	18.0	97.0	49.0	12.4	0	604.0	311.58	330	0	34.3	9.9	7.4	0.0	9.5	263.8	1001.1
Aug	22.1	49.1	34.8	15.0	95.0	49.0	12.1	0	666.0	306.13	328	0	34.6	9.6	7.4	0.0	9.5	212.2	1213.3
Sep	21.9	44.0	31.9	21.0	98.0	60.4	11.1	0	613.0	279.92	306	0	28.5	8.1	5.6	0.0	9.5	192.6	1405.9
Oct	18.3	41.0	28.2	23.0	97.0	71.9	10.9	0	559.0	261.05	266	0	59.5	5.1	4.5	13.0	22.5	145.8	1551.7
Nov	12.7	37.6	23.6	28.7	100.0	71.9	10.2	0	621.0	227.33	239	0	54.5	4.3	1.3	0.0	22.5	76.0	1627.7
Dec	11.9	33.4	19.5	25.0	100.0	79.5	10.7	0	513.0	241.15	230	0	26.8	6.4	5.6	8.5	31	66.2	1693.9
Av	15.2	41.2	27.4	23.0	98.5	66.5	11.4	0	701.4	308.47	329	0	37.4	8.3	6.5				

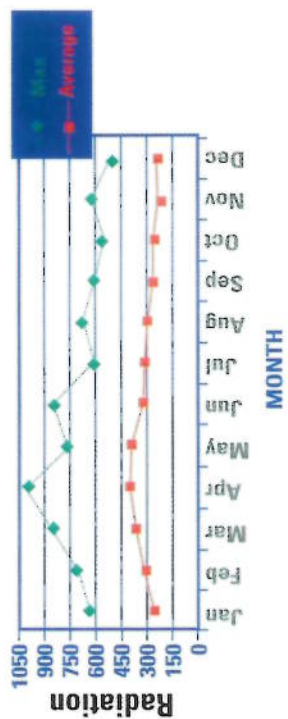
Appendix 1

Summary of Weather Information at ICBA Station (Continued)

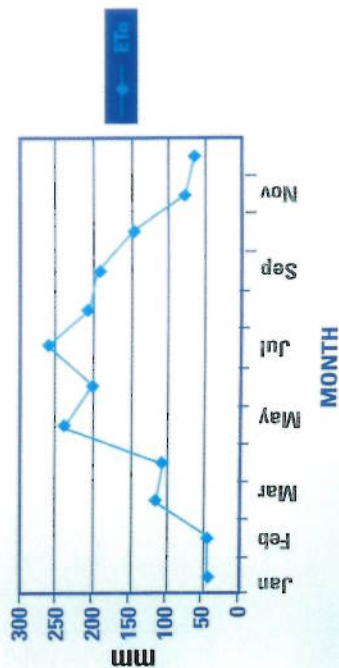
Temperature Data for Year 2000



Solar Radiation Data for Year 2000



Evapotranspiration



Appendixes

Appendix II

Agreements

During the year 2000 ICBA has signed Memoranda of Understanding with the following relevant Research and Development organizations:

Date	Organization
5 th April, 2000	The International Center for Agricultural Research in the Dry Areas (ICARDA)
10 th April, 2000	Pakistan Agricultural Research Council (PARC)
9 th October, 2000	Agricultural Research Education and Extension Organization (AREEO)



Appendixes

Appendix III

Visitors at ICBA

Visitors to the Center during the Year 2000

As part of ICBA management efforts to promote the Center locally, regionally and internationally, considerable time and effort is being made to welcome its visitors and give them an overview of the Center's activities.

International

- * H.E. Dr. Ahmed Mohammad Ali, IDB President, Jeddah, Kingdom of Saudi Arabia
- * Dr. Kadambot H. Siddique, Manager, Pulse Productivity and Industry Development, Crop Improvement Institute, Agriculture Western Australia, South Perth, Australia
- * Mr. John Sykers, Program Leader (Pulses), Division of Plant Industries, NSW Agriculture, Dubbo, NSW, Australia.
- * Mr. Mark Sargeant, NyPa Australia, Victoria, Australia
- * Mr. Salah Brahimi, CGIAR Secretariat, World Bank, Washington D.C., USA,
- * Dr. Omar Mtimet, Director, Directorate of Soils, Ministry of Agriculture, Ariana, Tunisia
- * Dr. S.A.Kulkarni, Director, Management & Operations, International Commission on Irrigation & Drainage (ICID), New Delhi, India
- * Dr. Abdullatif Hijazi, Emeritus Professor, Nuclear Research Center, Abu-Zaabel, Egypt
- * Dr. N.K. Tyagi, Director, Central Soil Salinity Research Institute (CSSRI), Haryana, India
- * Dr. Anwar Nasim, Advisor Science, Organization of Islamic Conference, Standing Committee on Scientific & Technical Cooperation (COMSTECH), Islamabad, Pakistan
- * Dr. Amin Ali Zadeh, Professor of Irrigation at Ferdowsi University, Mashhad, Iran
- * Eng. R. Zargar, Vice Minister of Energy in Water Affairs, Iran
- * Dr. H. Rahimi, Professor at Tehran University and Director of Agriculture Engineering Research Center, Iran
- * Dr. S. Nairizi, General Director of Toos Ab Consulting Engineering and Professor at Water and Energy University, Iran
- * Eng. Assadollahi, Secretary of Iran Comm. of Irrigation and Drainage and General Director of Water Projects in the Ministry of Energy, Iran

ICARDA-APRP

- * Dr. John Peacock, Regional Coordinator, ICARDA-APRP, Dubai, UAE
- * Dr. Ian McCann, Water & Irrigation Specialist, ICARDA-APRP, Dubai, UAE



Appendixes

ARC - Animal Improvement Institute and the Embassy of the Republic of South Africa

- * Mr. Pier C. Ronchietto, Manager, Foreign Services Unit, IRENE, South Africa
- * Mr. Martin Slabber, Counselor, Embassy of the Republic of South Africa, Abu Dhabi, UAE

Abu Dhabi Municipality

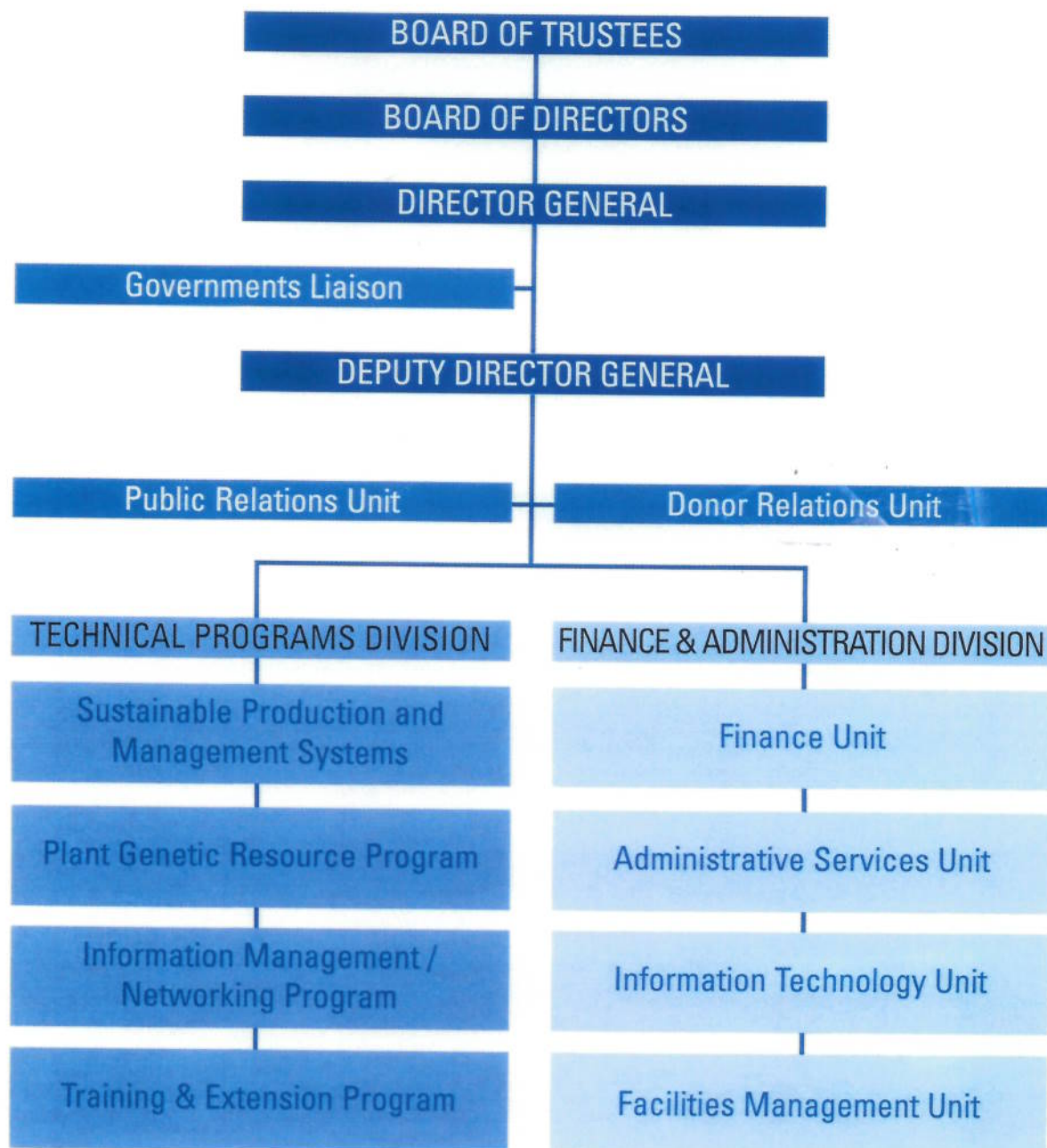
- * Eng. Mohammad Khalaf Al Mazrouei, Head of Agriculture Extension Section
- * Eng. Abdul Monem Ahmed Hussain Al Marshody, Agriculture Guidance, Marketing and Animal Wealth
- * Eng. Emad Saad
- * Eng. Khojali Abdourahman Ali

Environmental Research and Wildlife Development Agency (ERWDA), Abu Dhabi, UAE

- * Dr. Amrita G. de Soyza, Head of Terrestrial Environment Research Center
- * Mr. Majid Al Mansouri, Asst. Secretary General for Finance & Administration

Appendixes

Appendix IV ICBA Organizational Structure



Appendixes

Appendix V

Statement of Budget and Actual Expenses

Table 1: December 2000 Audited Expense Report

International Centre for Biosaline Agriculture Budgeted Actual Expense Statement for the Year Ending December 31, 2000	Year to Date Actual Expenses A	Year to Date Budget B	Year to Date Variance C	% C/B
Expenses				
Salaries	808,044.00	988,390.00	180,346.00	18%
Staff Benefits	684,238.00	977,400.00	293,162.00	30%
Board Expenses	5,568.00	25,000.00	19,432.00	78%
Supplies	235,157.00	238,027.00	2,870.00	1%
Contract Services	122,075.00	120,000.00	(2,075).00	-2%
Travel	68,995.00	68,807.00	(188.00)	0%
Utilities	160,073.00	80,925.00	(79,148.00)	-98%
Maintenance	66,250.00	80,000.00	13,750.00	17%
Depreciation	207,997.00	186,934.00	(21,063.00)	-11%
Total Operating Expenses	2,358,396.00	2,765,483.00	407,088.00	15%
Staff Loans	60,371.00	119,615.00	59,244.00	50%
Capital Expenditure	114,902.00	114,902.00	-	0%
Total	2,533,669.00	3,000,000.00	466,331.00	16%



Appendixes

Appendix VI

Core Staff

Management

Dr. Mohammad Al-Attar	Kuwait	Chairman of the Board of Directors/Director General
Mr. Ahmed Saleh Hariri	Saudi Arabia	Deputy Director General
Mr. Jugu Abraham	India	Donor Relations Specialist
Mrs. Hemmat Lashin	Egypt	Executive Secretary
Mr. Waseem Ali	Pakistan	Administrative Assistant

Technical Programs

Prof. Dr. Faisal Taha	USA	Director Technical Programs
Dr. Abdullah Jaradat	USA	Plant Genetic Resource Scientist
Dr. Abdullah Dakheel	Syria	Field and Forage Crops Scientist
Dr. Shoaib Ismail	Pakistan	Halophyte Agronomist
Dr. Bassam Hasbini	Lebanon	Irrigation Management Scientist
Mr. Peter Eichhorn	Germany	Acting Farm Manager
Ms. Hana Al-Zarouni	UAE	Agronomy Laboratory Technician
Mr. Mohamed Shahid	Pakistan	Plant Genetic Laboratory Technician
Mr. Khalil Al-Rahman	Pakistan	Halophyte Laboratory Technician
Mr. Anas Assainar	India	Irrigation and Farm Technician
Mr. Wameedh Monther	Iraq	Farm Technician
Mrs. Ann Bostock	UK	Administrative Assistant
Mr. Ghazi Al-Jabri	Syria	Administrative Assistant - Communications
Ms. Sohila Nowzar Vahidipoor	Iran	Library Assistant

Finance and Administration

Mr. Ghassan Sarris	Canada	Finance and Administration Officer
Mrs. Souhad El-Zahed	Lebanon	Office Administration and End User Support
Mr. Jamal Telmesani	Saudi Arabia	Technical Services Co-ordinator
Mrs. Kafa Al-Tamimi	Jordan	General Accountant
Mrs. Shazia Khan	India	Administration Assistant
Mrs. Rania Al-Bezreh	Syria	Receptionist

Appendixes

Appendix VII

Acronyms

ACSAD	Arab Center for Studies of the Arid Zones and Dry Lands (Syria)
AFESD	Arab Fund for Economic and Social Development (Kuwait)
AREEO	Agricultural Research Education and Extension Organization (Iran)
CGIAR	Consultative Group on International Agricultural Research
COMSTECH	Committee on Scientific and Technological Co-operation
FAO	Food and Agriculture Organization of the United Nations
IAEA	International Atomic Energy Agency
ICARDA	International Center for Agricultural Research in the Dry Areas
ICBA	International Center for Biosaline Agriculture
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IDB	<i>Islamic Development Bank</i>
IFAD	International Fund for Agricultural Development
LAN	Local area network
MAF	Ministry of Agriculture and Fisheries (UAE)
NARS	National agricultural research systems
NGO	Non-governmental organizations
OPEC	Organization of Petroleum Exporting Countries (Austria)
PARC	Pakistan Agricultural Research Council (Pakistan)
R & D	Research and development





International Center for Biosaline Agriculture (ICBA)
Dubai, United Arab Emirates

P.O. Box 14660, Telephone: + 971 4 3361100 Fax: + 971 4 3361155
E-mail: icba@biosaline.org.ae, Website: www.biosaline.org