



Biosalinity News

ISSN 1563-1532

Newsletter of the International Center for Biosaline Agriculture

VOLUME 10, NUMBER 2 (SPECIAL ISSUE)

MAY 2009

FROM THE EDITOR

This special edition of *Biosalinity News* covers ICBA's 10-year anniversary celebration in 2009.

On 25 and 26 March, ICBA held a series of events to showcase its achievements over the last ten years. Government officials, scientific officers, farmers, and representatives from donor agencies and the private sector were invited to participate in the functions.

The first article covers the opening ceremony, the scientific seminar and the field day.

Some facts about ICBA's establishment, new strategic mandate and facilities are covered on page 3 followed by summaries of ICBA's projects at the research station and those in IDB-member countries and within the United Arab Emirates. We conclude with highlights of ICBA's capacity building, networking and publications.

For more information on ICBA's projects and activities, please visit www.biosaline.org

The Editor
Biosalinity News, ICBA
PO Box 14660
Dubai, UAE
editor@biosaline.org.ae

CELEBRATING 10 YEARS OF ACHIEVEMENTS

ICBA celebrated its tenth anniversary on 25 and 26 March. To commemorate its ten years of achievements since its establishment in 1999, ICBA welcomed donors and partners from peer organizations and the national agricultural research systems of the IDB-member countries to participate in the opening ceremony, a series of seminars and a tour of the research station.



H.E. Dr Rashed Ahmad Bin Fahad (left), H.E. Dr Ahmad Mohamed Ali (middle) and Mr Fawzi AlSultan delivering their speeches

The patron of the anniversary, H.E. Dr Rashed Ahmed Bin Fahad, UAE Minister of Environment and Water, and H.E. Dr Ahmad Mohamed Ali, President of the Islamic Development Bank Group, attended the events along with representatives of regional and international donors, research organizations, the private sector, and diplomatic missions in the UAE, and ICBA staff.

In his speech, H.E. Dr Rashed Ahmed Bin Fahad, UAE Minister of Environment and Water announced that the UAE was proud to host ICBA and praised the Center's achievements, particularly in the areas of water and food security, as being of great importance to the country and the region. Dr Bin Fahad alluded also to the continuous support of ICBA by the IDB Group and expressed the UAE's interest in extending the strategic partnership with the IDB Group.

IDB Group President H.E. Dr Ahmad Mohamed Ali, whose vision has guided the establishment of ICBA, recalled in his speech the time of signing the agreement with the UAE Government and the big challenges that the new Center had faced successfully. His Excellency also praised the decision of the UAE Government to support ICBA beyond the strategic partnership that had started in 1996.

continued on page 2



Participants saluting UAE national anthem

International Center for Biosaline Agriculture (ICBA)

PO Box 14660, Dubai, UAE Tel: +971 4 336 1100 Fax: +971 4 336 1155 E-mail: icba@biosaline.org.ae

www.biosaline.org

Celebrating 10 years of achievements

continued from page 1

Mr Fawzi AlSultan, ICBA Chair of the Board of Directors thanked warmly the UAE Government, the IDB and all donors for their continued support. After briefing the audience on the Center's key achievements over the last decade, Mr AlSultan applauded ICBA management and staff for their dedicated efforts to make ICBA a "Center for Excellence" despite limited funding and staff numbers.

ICBA also honored H.E. Dr Rashed Ahmad Bin Fahad, UAE Minister of Environment and Water, H.E. Saeed Bin Mohammad Al Raqabani, UAE Former Minister of Agriculture and Fisheries, H.E. Dr Ahamad Mohamed Ali, President of the Islamic Development Group, H.E. Majid Al Mansouri, Secretary General of the Environment Agency - Abu Dhabi and the Ministry of Agriculture in Oman for their considerable, ongoing support of ICBA.

At the conclusion of the opening ceremony, two scientific seminars were held:

Session 1: Role of science and technology in agriculture and food security

- *The role of science and technology to enhance water productivity and food security* by **Dr Mahmoud Solh**, Director General of the International Center for Agricultural Research in the Dry Areas (ICARDA)
- *Principles of food security in the Arab world* by **Dr Abdel-Karim Al Sadeq**, Advisor, Kuwait Fund for Economic and Social Development, Kuwait

Session 2: Water resources: Optimization of resource use and sustainable production systems

- *Water and food security in GCC countries: Achieving and expanding a sustainable balance* by **Dr Adil Bushnak**, Chairman Bushnak Group, Jeddah, Saudi Arabia
- *Water research for food production under scarce water condition* by **Dr Akiça Bahri**, Regional Director, West Africa, IWMI
- *Saving fresh water through utilization of marginal quality water in agriculture: ICBA's challenges and successes* by **Prof Dr Faisal Taha**, Director Technical Programs, ICBA

"There is a need for higher share of public spending allocated to agriculture"

Dr Mahmoud Solh
Director General ICARDA

"Availability of local qualified human capital is the most essential factor to benefit from R&D investment"

Dr Adel Bushnak
Chairman Bushnak Group

"Scientific research is the main component of agricultural development"

Dr Abdel-Karim Al-Sadeq
Advisor, Kuwait Fund for Economic and Social Development

"Scientists should work hand-in-hand with politicians to achieve water and food security"

Dr Mohammad H Al-Attar
Former ICBA Director General and current Member, ICBA Board of Directors

"Wastewater management is a driving component in water resources management"

Dr Akiça Bahri, Regional Director, West Africa, IWMI

Anniversary participants visit ICBA's research station

On March 26, participants visited the ICBA research station and discussed current projects with the scientists.

Before touring the research plots, Dr Abdullah Dakheel, ICBA Field and Forage Crops Scientist, briefed participants on key research achievements.



HIGHLIGHTS OF ICBA

Establishment

The establishment of the International Center for Biosaline Agriculture (ICBA) was based on a strategic decision in the early 1990s to build a research and development institute focusing on the problems of salinity and using saline water for irrigated agriculture. The Islamic Development Bank under the visionary leadership of its President, Dr Ahmed Mohamed Ali, took the lead in establishing the Center to build world-class modern research facilities and to recruit international scientists to conduct research on improving the well-being of poor farmers cultivating crops under marginal conditions. A team of dedicated staff from the Islamic Development Bank and the Government of the United Arab Emirates worked hard to establish the Center in Dubai. The Center has received generous support from the UAE Government, the Arab Fund for Economic and Social Development, the OPEC Fund for International Development, the International Fund for Agricultural Development, and the Municipality of Dubai to undertake its activities.

Over the last ten years, the Center has been able to evolve strategically from the initial focus on applied research and technology development in saline irrigated agriculture, to the broader mandate of improving agricultural production within an integrated water resource system approach. Significant support from donors and fellow researchers and partners in national programs has encouraged this evolution in the Center's research agenda.

Strategic Plan 2008-2012

The Center has a mandate to *help water-scarce countries improve the productivity, social equity and environmental sustainability of water use through an integrated water resource systems approach, with special emphasis on the effective use of marginal quality water.*

To achieve this mandate, ICBA has been providing collaborative research and development, capacity-building and knowledge-sharing, with particular focus in two areas:

- Integrated water resource system
- Marginal quality resources

The third program is the *Capacity-building and knowledge-sharing Program* demonstrating ICBA's significant emphasis on this critical aspect of scientific research.

Land area

The total area of ICBA's headquarter is about 100 hectares, out of which 65 ha of mainly 2-5 meter high sandy hummocks is left undeveloped for the protection and rehabilitation of natural ecosystems common in the

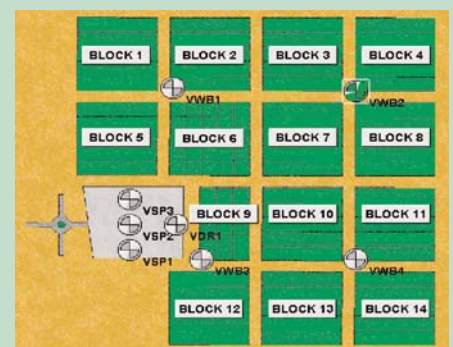
area. Fully developed for research, the remaining 35 ha are divided into 14 blocks, 2.5 ha each. Field salinity control can be achieved up to the plot level. Fields supplied with low salinity water are allocated for plant propagation and seed multiplication. Of the soil taxonomic class (Typic torripsamments), the native soils are loose, non-saline, fine sand in texture, very deep, somewhat excessively drained, moderate to rapidly permeable, strongly calcareous and moderately alkaline. Hardpan is also encountered in some areas.

Irrigation Water Sources and Facilities

ICBA farm has several sources of water; low salinity (2-3 dS m⁻¹; 1,400-2,100 ppm) water received from the Dubai Electricity and Water Authority (DEWA), high salinity water (20 to 35 dS m⁻¹; 14,000-25,000 ppm) from two drilled wells at the farm and sea water brought via tankers. Water is stored in three closed water tanks which contain a fully sealed plastic sheet sufficient to store 350-2,000 m³. When required, the water is pumped and filtered before distribution to the main network.

These low and high saline water sources are combined in the mixing boxes located at the start of each strip in each block. Water can be mixed at different proportions as per the salinity level requirements of a specific experiment. The experimental farm also uses sea water for special experiments. Treated municipal water will soon be used as a water source.

Irrigation methods in the farm include drip, bubbler and micro-sprinkler. A sub-surface drainage network system exists in the research blocks. Two sump pumps in two separate sumps/tanks were installed in the north-eastern boundary of the farm to pump water into the evaporation pond.



Layout of ICBA research station

Facilities

- Auditorium and training hall
- Genebank
- Central Analytical Lab
- Seed unit
- Greenhouses
- Shadehouses
- Storage facilities
- Plant processing and drying rooms
- Machinery and workshop building

RESEARCH AT ICBA AGRICULTURAL STATION 1999-2009

ICBA is presently conducting at its Research Station over 15 projects relating to its mandate in marginal water and biosaline agriculture. These projects include:

Evaluation and Crop Improvement

Conservation and sustainable use of plant genetic diversity to improve the productivity of marginal ecosystems by promoting agricultural production, energy generation, environmental greening and ecosystem rehabilitation in marginal environments through identifying, introducing, conserving and distributing suitable plant species.



Quinoa, a highly nutritive alternative crop for saline lands

Screening and evaluation of germplasm for forage and seed yield potential using marginal quality water. A large number of genetic materials of economically important salt-tolerant crops are screened at various salinity levels under pot culture to select promising genotypes for field evaluation and distribution amongst NARS in the WANA region. Amongst the tested crops are barley, *Triticale*,

buffel grass, fodder beet, fodder rape/brassica, safflower, pearl millet, sorghum, *Sesbania*, cowpea, guar and sunflower.

Evaluation of native and introduced genotypes under local conditions to identify salt-tolerant genotypes; develop management systems related to soil, water and plants; and assess uses and economics of the tested production systems.

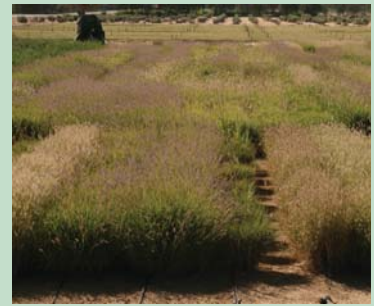
Propagation and multiplication of halophytes and salt-tolerant plants for fodder, bio-energy and landscaping to have sufficient seeds and vegetative cover of halophytes and salt tolerant plants for the trials at ICBA and for dissemination with partners through collaborative projects.

Production Management Systems

Optimizing management practices for maximum production of two non-conventional salt-tolerant grasses, *Sporobolus virginicus* and *Distichlis spicata*, and three saltbush (*Atriplex*) species, *A. lentiformis*, *A. nummularia* and *A. halimus*.

Biosaline agroforestry is the remediation of saline wastelands through production of renewable energy, biomaterials and fodder by investigating the productive potential of biosaline agroforestry systems in the saline environment from the selection of trees to an optimized management system, and the development of economically feasible value chains.

Agroforestry using Acacia ampliceps, Sporobolus arabicus and Paspalum vaginatum at different salinity levels to test the potential of the grass (fodder component) and tree species integrated for increased productivity.



Diversity of buffel grass accessions

Prospects of growing Distichlis spicata var. Yensen-4a (NyPa forage) with sea water in an arid environment to be a source of forage/fodder for higher animals.

Horticulture

Investigation of elite date palm varieties for salt-tolerance to evaluate the long-term impact of irrigation with marginal quality water on the growth, fruit yield and quality of elite date palm varieties in the Arabian Peninsula.

Land And Water Management

Mapping the soil at ICBA Research Station to locate soil classes with specified properties according to international standards.

Evaluation of treated water from the First AFG salt-treatment plant to assess the suitability of treated water on the growth and production of sunflower in comparison with untreated water.

Water balance study for barley in weighing lysimeter to determine the actual water use and coefficient of the crop.

Salinity Monitoring System at ICBA to assess the differences between agricultural fields in the research station, thus allowing more precise management of the fields.



Long-term studies of salt-tolerant non-conventional grasses

RESEARCH IN IDB-MEMBER COUNTRIES 1999-2009

CBA is undertaking collaborative projects in the Middle East, northern Africa and the Central Asian region (IDB-member countries) with partners to improve the livelihoods of the rural poor. Among these projects are:



Fodder beet grown with saline water has proved successful in many countries

The Forage project for the WANA region

to improve livelihood and incomes for resource-poor rural farmers in degraded and marginal lands in Jordan, Oman, Pakistan, Palestine, Syria, Tunisia and the United Arab Emirates of West Asia and North Africa region. By introducing salt-tolerant

forages and management practices, under-utilized marginal land and poor quality irrigation water resources can be used, thus saving freshwater. An important component of the project will be developing the capacity of the NARS.

Sorghum and pearl millet for enhanced crop-livestock productivity in saline lands

to improve agricultural productivity in salt-affected arid and semi-arid environments of the Near East and Asia through the development of salt-tolerant genotypes with high grain and forage yield.

Bio-energy forestry (BIOSAFOR)

will advance the knowledge about salinity thresholds of promising tree species in Bangladesh, India and Pakistan by investigating the potential productivity of biosaline agroforestry systems in areas with growing populations through the selection of trees, optimized



Improving the livelihood of farmers in the region



Saving fresh water resources by developing salt-tolerant forages

management, and the development of economically feasible value chains.

Creation of 'Bright spots' in the Aral Sea

will enable communities in Uzbekistan, Kazakhstan and Turkmenistan to combat land and water resource degradation through the introduction of better genetic material and management strategies.

Production of halophytes in Iran to optimize productivity and forage quality in a country that has an estimated 27 million hectares of salt affected lands.

Development of technologies to harness the productivity potential of salt-affected areas of the Indo-Gangetic, Mekong, and Nile River basins.

Utilization of biosaline agriculture by the National Prawn Company in Saudi Arabia

to better use the discharged water of the prawn farming ponds for landscaping and other production systems.

Introduction of salt-tolerant forage production systems to salt-affected lands in the Sinai Peninsula in Egypt to develop an effective way to overcome the limitation of raising salinity levels on agricultural production.

Reclaiming salt-affected farms in Tajikistan to investigate the on-farm management systems in order to bring abandoned farms back into production through the use of salt-

tolerant conventional and non-conventional species, and halophytes for bio-drainage, agro-forestry and as forage crops.

Identifying new sources of income for poor farmers in Bangladesh to improve the livelihood of farmers through growing horticultural cash crops, such as tomato, chili, watermelon, cucumber and sunflower during the rice off-growing season.

Use of marginal quality water for productive use of desert and salt-affected areas in Pakistan by selecting economic crops that would help in the reclamation of the degraded soil.



Developing salt-tolerant food and feed crops

RESEARCH IN THE UNITED ARAB EMIRATES 1999-2009

The story of ICBA since it was established in 1999 is one of a close relationship between a host country and a research center – a relationship that has resulted in the implementation of 18 projects, and the training of about 250 Emiratis. As well as projects at its research station, ICBA has other collaborative projects in the country, such as:



Mangroves stabilize coastal areas and provide a sanctuary for marine life and water birds

Conserving biodiversity. The natural vegetation of the UAE is threatened by urban encroachment, overgrazing, increased water demand and desertification. Consequently the UAE and ICBA are working together to counteract the negative effects of human activity on native plant species. In collaboration with the Ministry of Environment and Water (MOEW), ICBA has collected native species for long-term conservation and further study. With the Environment Agency- Abu Dhabi (EAD), ICBA has

explored the use of mangroves for use in stabilization and environmental greening along the UAE coast. ICBA has also been collecting germplasm of species with proven or potential salinity tolerance to provide a source of genetic diversity.

Diversifying the agricultural base. Agricultural production in the UAE relies significantly on saline groundwater. This salinity is continually increasing because of over-pumping and insufficient recharge. Maintaining current levels of agricultural production requires plant production systems suited to a wide range of salinity levels. ICBA, United Arab Emirates University (UAEU) and various government agencies have developed forage and crop production systems, along with suitable management practices, for a wide range of saline environments. Several genotypes with high grain and fodder yields, such as barley, fodder beet, pearl millet, sorghum and perennial grasses – notably buffel grass and various *Atriplex* species – have been identified as highly salt-tolerant.



Studying the opportunities of using surface brine water in agricultural production

Scientists have adapted plants from the genus

Atriplex and grasses such as *Sporobolus virginicus*, *Distichlis spicata* and *Paspalum vaginatum* for intensive production and management systems that look exceptionally promising. These plants are economically useful for feeding livestock, stabilizing deserts and greening the environment.

Improving water management. To manage the demand for water in irrigated agriculture, ICBA is partnering MOEW to predict brine water use for forage crops, vegetables, fruits and some cereals based on soils, agro-meteorological and crops data.

Managing demand and supply. To meet the challenge for balancing available water resource supply and demand (within sustainable environmental, economic and social frameworks), EAD engaged ICBA to develop the Water Master Plan for Abu Dhabi Emirate.

New crops for saline lands. The UAE and ICBA are collaborating in identifying species that can be grown by irrigation with saline water to provide animal feed and other agricultural products.

Preserving wildlife. ICBA worked with the Abu Dhabi Tourism Development and Investment Company to manage resources at the Sir Bani Yas Island to support the wildlife, their forage, and requirements for tourist activities.

Soil Survey of Abu Dhabi Emirate. In collaboration with Environment Agency- Abu Dhabi, ICBA conducted a soil survey to provide soil information to facilitate broad land use planning and agricultural expansion in the Emirate.

International collaboration. In the late 1990s, the International Atomic Energy Agency (IAEA) invited various governments to take part in an international project *Sustainable Utilization of Saline Groundwater and Wastelands for Plant Production*. The coordination of this activity was delegated to the Government of the UAE. ICBA worked with the UAE on these projects to investigate the long-term sustainability by selecting representative farms in different Emirates where biosaline agriculture could be demonstrated.



UAE has a wide collection of date palm trees



Unique anhydrite soil discovered in Abu Dhabi Emirate

CAPACITY BUILDING AT ICBA 1999-2009

ICBA has invested much of its human and financial resources over the last ten years in building the capacity of people from IDB-member countries. Capacity-building focuses on providing specialized courses in aspects of managing fresh and marginal water resources and agricultural production systems for scientists and technicians. More than 800 individuals from 47 countries around the world have received specialized training since September 2000. Out of the 43 courses conducted up to April 2009, 30 courses were given at ICBA's headquarters in Dubai, and 13 were provided in Bahrain, Iran, Libya, Morocco, Niger, Syria, Tunisia and Uzbekistan. These courses covered areas related to irrigation management and modeling, unconventional water resources, genetic resources, soil technologies, rehabilitation of saline lands, field crops production systems, and halophytes. ICBA has always tailored the course to meet the participants' needs and level of expertise.

Furthermore ICBA has also organized over the last ten years many seminars and symposia in the UAE and in many IDB-member countries in the fields of biosaline agriculture attended by thousands of policy-makers, scientist and technicians. ICBA also attracts experts and specialists from around the world to its consultations, workshops and conferences, providing participants with opportunities to tap into the global knowledge base.

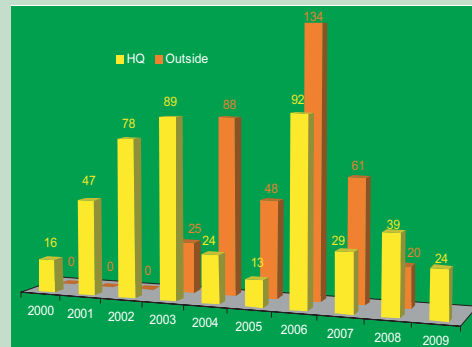


Number of participants to ICBA's training courses from each country (from September 2000 to April 2009)

Afghanistan	4	Mali	3
Algeria	6	Mauritania	4
Angola	2	Morocco	22
Armenia	1	Mozambique	2
Azerbaijan	18	Niger	30
Bahrain	36	Oman	54
Bangladesh	4	Pakistan	9
Botswana	2	Palestine	15
Burkina Faso	4	Qatar	5
Egypt	12	Saudi Arabia	6
Georgia	2	Senegal	8
Indonesia	3	Sierra Leone	1
Iran	57	Somalia	2
Iraq	27	Sudan	16
Jordan	21	Syria	29
Kazakhstan	20	Tajikistan	18
Kenya	3	Tanzania	1
Kuwait	8	Tunisia	30
Kyrgyzstan	15	Turkmenistan	11
Lebanon	3	UAE	234
Lesotho	2	Uzbekistan	55
Libya	11	Yemen	7
Madagascar	1	Zimbabwe	1
Malaysia	2	Total	827



Whether in the classroom, laboratory or field, at headquarters or in other countries, capacity building is one of ICBA's strengths



Number of participants to ICBA's training courses (from September 2000 to April 2009)

ARAB WATER ACADEMY – NEW INITIATIVE IN 2008

The Arab Water Academy (AWA), an institution established by the Arab Water Council (AWC) and co-hosted by both EAD and ICBA, was launched in 2008 under the patronage of His Highness Sheikh Hamdan bin Zayed Al-Nahyan, Deputy Prime Minister of the UAE and Chairman of EAD.

The AWA's mission is to transform the governance and management of water in the Arab region by facilitating individuals and groups to become 'change agents', that is, encouraging change to happen within organizations through executive leadership education, mentoring and coaching. The major shift is to thinking about water management holistically.



Courses planned for 2009 include:

- Water governance for future water leaders.
- Water diplomacy.
- Financial sustainability of utilities.
- Unconventional Water.

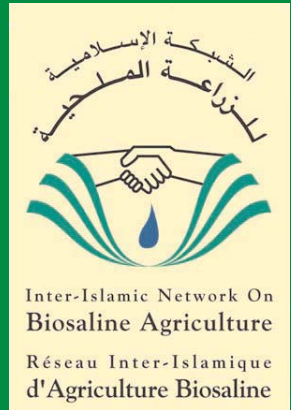
The AWA represents a significant investment in the human capital of decision makers, professionals and scientists in the water sector.

Networking - INBA

The Organization of the Islamic Conference (OIC) Ministerial Committee on Scientific and Technological Cooperation (COMSTECH) asked the Government of the UAE to establish an Inter-Islamic Network on Biosaline Agriculture (INBA) for its member-countries. The UAE asked ICBA to assist in this endeavor, and INBA was constituted in 2002 as an apolitical, non-profit, independent and autonomous body promoting biosaline

agriculture. By mutual agreement, INBA was located at ICBA Headquarters.

INBA provides a forum for collaborative action and networking to stimulate and strengthen national and international institutions and aid agencies. Members include ministries of agriculture and water resources, universities, agricultural research and development agencies, extension services, NGOs and farmer groups.



PUBLICATIONS

Over the last 10 years, ICBA has published a wide selection of publications such as annual reports, newsletters, seminar proceedings, plant manuals and taxonomies, brochures, training manuals, calendars and posters in English, Arabic and some of them in French. These publications have been distributed to more than 2500 recipients in 120 countries around the world.



First issue of Biosalinity News



Wide selection of publications

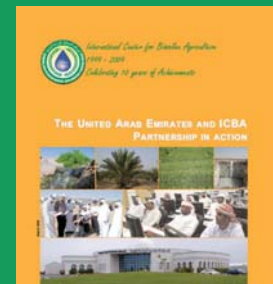
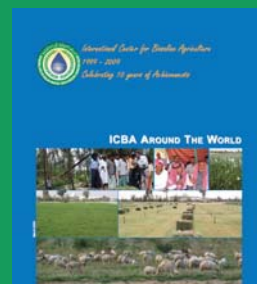
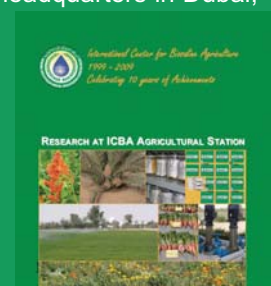
ANNIVERSARY DOCUMENTARY

Celebrating its 10th anniversary in 2009, ICBA produced an 8-minute DVD documentary in English that covers the Center's history, achievement milestones, projects and capacity building activities since signing the agreement between the Islamic Development Bank and the Government of the United Arab Emirates in 1996.



ANNIVERSARY BROCHURES

ICBA produced 3 new brochures in English and Arabic for the occasion of the 10th anniversary. *Research at ICBA Agricultural Station* covers projects conducted at the Center's headquarters in Dubai, UAE. *The United Arab Emirates and ICBA – Partnership in Action* focuses on the joint projects in the host country. *ICBA Around the world* highlights collaborative projects in IDB-member countries.



For more information on ICBA and its latest news, please visit www.biosaline.org