



Biosalinity News

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FROM THE EDITOR

This first edition of *Biosalinity News* for 2009 covers several issues and subjects.

The lead article is about a new MoU signed with the Ministry of Agriculture in Oman to combat salinity problems.

We also provide updates on the two new bilateral projects with the UAE Ministry of Environment and Water which have started recently.

Two scientific articles appear as well. The Genetic Resources team reports on the achievements of *Collecting the germplasm of native plants*. The ICBA Soil Management scientists provide details of the *Soil information breakthrough in Abu Dhabi*. An update on recent projects which commenced in 2008 is also included.

News of recent workshops, seminars and training courses are highlighted as well.

Contributions on research or projects of interest to our readers are always welcome, as are letters to the Editor. Please send your submissions, including relevant photographs and figures, to:

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

COMBATING SALINITY IN OMAN



The national strategy aims at conserving water resources in Oman from salinization and pollution

His Excellency Khalfan Bin Saleh Al Naabi, Deputy Minister of Agriculture Oman, signed a project agreement on 4 January 2009 with Dr Shawki Barghouti, ICBA Director General, to manage a project to formulate a *national strategy for*

Oman to combat salinity and protect water resources from pollution and salinity.

The project goals are to:

1. Assess the salinity and pollution of ground-water resources.
2. Assess the economic costs of salinity and pollution of ground-water resources.
3. Identify the technical and management practices to combat water salinity and pollution.
4. Identify the procedures required to increase productivity of salt-affected areas.
5. Develop and implement sustainable integrated water resources management practices.
6. Review current policies and procedures to combat water salinity and pollution.
7. Build the capacity of Omani individuals and institutions to work together in combating water salinity and pollution.

NEW BILATERAL PROJECTS IN THE HOST COUNTRY

The United Arab Emirates Ministry of Environment and Water (MOEW) and the International Center for Biosaline Agriculture (ICBA) signed an agreement on the 7 August 2008 to work together for two years on two research projects:

1. Irrigation planning and management; and
2. The safe disposal of brine from the reverse osmosis (RO) desalination plants used for irrigation in the UAE.

In project 1, fifteen sites (three from each five agro-climatic zones of the UAE) have been selected. All of these sites have small-scale RO salt-water treatment units. Saline groundwater is being used as the feed water in these units. Data from three additional sites where groundwater is applied directly to crop production will also be collected.

The combined information on soils, crops, irrigation and management practices, will be

used in crop water use predictions through modeling studies, and also in irrigation planning and demand management for selected crops. Wastewater use guidelines for agriculture will also be developed for safe utilization of available reclaimed municipal wastewater.

In project 2, data from the RO units will be used to assess current brine disposal

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Surface brine disposal on slope of sand dunes

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

New bilateral projects in the host country

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practices. The current brine disposal practices include:

- Surface disposal (to excavated and non-excavated pits where both evaporation and groundwater recharge occurs, and/or to the mountain terrain, or the steep edge of sand dunes where primarily groundwater recharge occurs).
- Deep well injection to aquifer.
- Discharge directly to aquifer via dug well.
- Irrigation for high salt-tolerant plants.
- Sea beach disposal.



Small RO units in the Eastern region



Use of brine in cooling pads of green house

- Blending or mixing with groundwater for date palm irrigation.
- Use in cooling pads of green houses.
- Dumping into wadi channel beds.

Both economic and environmental impact analyses will be conducted in addition to the simulation of salt transport through soil profile. An important output of the project will be the formulation of guidelines for managing RO plants in the UAE agriculture industry, in order to avoid groundwater contamination and other environmental hazards resulting from brine disposal practices.

For more information, contact Dr N Akhand n.akhand@biosaline.org.ae

COLLECTING THE GERmplasm OF NATIVE PLANTS

NK Rao and Mohammed Shahid, Plant Genetic Resources Program, ICBA¹

The United Arab Emirates (UAE) has an arid desert climate which severely limits the number of plants adapted to these conditions. Previous botanical surveys have documented about 750 plant species growing in the UAE which have special adaptation to the local environment. However, many of the species are coming under increasing threat due to rapid urbanization and expansion of human settlements, in addition to overgrazing. A large number of the native species have economic uses such as food, fodder and medicine, and have great potential for exploitation. Due to their natural adaptation, they will be of great value for various uses such as the rehabilitation of degraded rangelands, landscaping and others compared to exotic and introduced species. It is therefore important to collect and conserve these species to be able to use them in future mitigation and rehabilitation plans.

As described in the August 2007 issue of this newsletter, the International Center for Biosaline Agriculture (ICBA) prepared a plan to collect and conserve the native species of economic importance. In the first phase, 97 samples of 24 taxa were collected - mainly of trees and shrubs which flower in spring. Several economically important annual species could not be collected in this phase due to the advancement of the dry

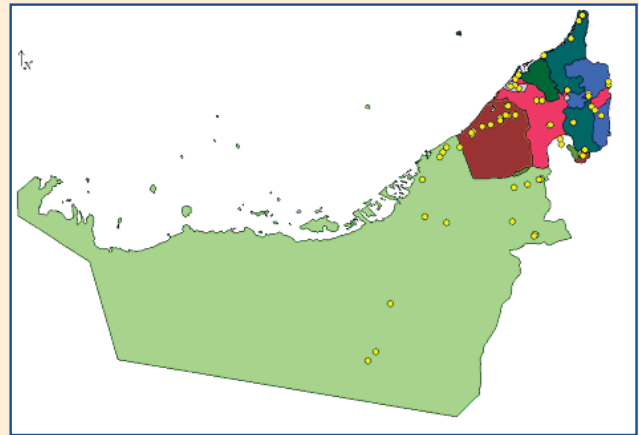


Figure 1: Germplasm collecting locations

season. Therefore, a second phase of collecting was undertaken during May and June 2008, covering areas shown in Figure 1. In total, 129 samples were collected, which included 33 species of forage value and 25 others of medical and ornamental value (Tables 1 and 2).

Some of the important forages collected during this phase are grasses such as *Cenchrus ciliaris*, *Centropodia forsskaolii*, *Chloris virgata*, *Coelachyrum piercii*, *Lasiurus scindicus*, *Panicum turgidum*, *P. antidotale*, *Pennisetum divisum*, *Saccharum ravennae*, *Sporobolus iocladius* and *Tricholaena teneriffae*; and legumes like *Crotalaria*

1. For more information, contact n.rao@biosaline.org.ae

aegyptiaca, *Indigofera intricata* and *Rhynchosia schimperi*. In addition to these species, *Atriplex leucoclada*, *Dactyloctenium scindicum*, *Alhagi graecorum*, *Indigofera arabica* and *I. oblongifolia*, with highly restricted distribution, were also collected.

Other species of interest from the medicinal or landscaping/ornamental point of view collected in this phase are: *Acacia nilotica*, *Aerva javanica*, *Boerhavia elegans*, *Calligonum crinitum*, *Cleome amblyocarpa*, *Citrullus colocynthis*, *Convolvulus* spp. *Cymbopogon commutatus*, *Dipterygium glaucum*, *Ipomea biloba*, *Moringa peregrina*, *Rumex vesicarius*, *Senna alexandrinum*, *S. italica* and *Withania somnifera*.

Although the timing of the mission was appropriate to collect seeds in many economically important species, a few target species like *Medicago laciniata*, *Lotus gracini*, *Trigonella hamosa* were not found, probably because of the uneven distribution of rainfall this year. Furthermore the missions were too short to thoroughly explore the many wadis in



Cenchrus setigerus



Rumex vesicarius



Alhagi graecorum



Senna alexandrinum



Moringa peregrina



Indigofera oblongifolia

Table 1: List of Forage species collected

	Botanical name	Family	No. of samples
1	<i>Acacia nilotica</i>	Leguminosae	1
2	<i>Aeluropus lagopoides</i>	Poaceae	2
3	<i>Alhagi graecorum</i>	Leguminosae	1
4	<i>Atriplex leucoclada</i>	Chenopodiaceae	1
5	<i>Cenchrus ciliaris</i>	Poaceae	7
6	<i>Cenchrus pennisetiformis</i>	Poaceae	4
7	<i>Cenchrus setigerus</i>	Poaceae	2
8	<i>Centropodia forsskaolii</i>	Poaceae	3
9	<i>Chloris virgata</i>	Poaceae	1
10	<i>Coelachyrum piercii</i>	Poaceae	7
11	<i>Crotalaria aegyptiaca</i>	Leguminosae	3
12	<i>Cymbopogon commutatus</i>	Poaceae	1
13	<i>Dactyloctenium scindicum</i>	Poaceae	1
14	<i>Desmostachya bipinnata</i>	Poaceae	1
15	<i>Indigofera arabica</i>	Leguminosae	1
16	<i>Indigofera colutea</i>	Leguminosae	1
17	<i>Indigofera intricata</i>	Leguminosae	2
18	<i>Indigofera oblongifolia</i>	Leguminosae	1
19	<i>Lasiurus scindicus</i>	Poaceae	3
20	<i>Panicum antidotale</i>	Poaceae	5
21	<i>Panicum turgidum</i>	Poaceae	6
22	<i>Pennisetum divisum</i>	Poaceae	10
23	<i>Rhynchosia schimperi</i>	Leguminosae	2
24	<i>Saccharum ravennae</i>	Poaceae	1
25	<i>Sporobolus iocladus</i>	Poaceae	2
26	<i>Sporobolus spicatus</i>	Poaceae	6
27	<i>Stipagrostis ciliata</i>	Poaceae	2
28	<i>Stipagrostis plumosa</i>	Poaceae	3
29	<i>Tephrosia apollinea</i>	Leguminosae	3
30	<i>Tephrosia nubica</i>	Leguminosae	2
31	<i>Tephrosia uniflora</i>	Leguminosae	2
32	<i>Tricholaena teneriffae</i>	Poaceae	2
33	Unidentified	Poaceae	3

the Hajar mountains which harbor unique species such as *Pistacia khinjuk* (wild pistachio), and *Amygdalus arabica* (wild almond). It is therefore planned to undertake follow up missions during March-April 2009 to collect these as well as other important species.

Table 2: List of other species collected

	Botanical name	Family	No. of samples
1	<i>Aerva javanica</i>	Amaranthaceae	3
2	<i>Albizia lebbek</i>	Leguminosae	1
3	<i>Amaranthus viridis</i>	Amaranthaceae	2
4	<i>Boerhavia elegans</i>	Nyctaginaceae	1
5	<i>Calligonum comosum</i>	Polygonaceae	1
6	<i>Calligonum crinitum</i>	Polygonaceae	1
7	<i>Cleome amblyocarpa</i>	Capparaceae	2
8	<i>Cleome noeana</i>	Capparaceae	1
9	<i>Chrozophora oblongifolia</i>	Euphorbiaceae	1
10	<i>Citrullus colocynthis</i>	Cucurbitaceae	1
11	<i>Convolvulus cephalopodus</i>	Convolvulaceae	2
12	<i>Convolvulus prostratus</i>	Convolvulaceae	1
13	<i>Convolvulus virgatus</i>	Convolvulaceae	2
14	<i>Dipterygium glaucum</i>	Capparaceae	2
15	<i>Ipomoea biloba</i>	Convolvulaceae	1
16	<i>Moringa peregrina</i>	Moringaceae	1
17	<i>Ochradenus aucheri</i>	Resedaceae	3
18	<i>Rumex vesicarius</i>	Polygonaceae	1
19	<i>Salvia aegyptiaca</i>	Labiatae	1
20	<i>Salvia macilenta</i>	Labiatae	1
21	<i>Senna alexandrinum</i>	Leguminosae	1
22	<i>Senna italica</i>	Leguminosae	2
23	<i>Withania somnifera</i>	Solanaceae	1
24	<i>Zizyphus spina-christi</i>	Rhamnaceae	4
25	<i>Silene villosa</i>	Caryophyllaceae	1

EVENTS

BIOMASS FOR BIOENERGY: USING WASTELANDS FOR FUTURE

A workshop for the BIOSAFOR (Biosaline Agro-Forestry) project was held at ICBA, Dubai, from July 20-22, 2008. The project is funded by the European Commission (6th framework program) and is undertaken in seven countries, including the United Arab Emirates. The Netherlands, Germany and Spain are the other partners (from Europe), whereas Bangladesh, India and Pakistan represent the DEV (Developed) countries. The OASE Foundation Netherlands has the overall role of the 'Project Coordinator'. The International Center for Biosaline Agriculture (ICBA) serves as the coordinating unit for the DEV country partners and also is a member of the Project Executive Committee, with Dr Shoaib Ismail serving as the 'Regional Coordinator'.

The overall objective of the BIOSAFOR project is twofold:

1. To contribute to the development of biosaline agro-forestry systems for various saline environments (local/regional approach); and
2. To explore the potentials and options for biomass production in saline environments (globally).

These two objectives on a larger scale look at the potential of growing tree species on saline wastelands and/or with saline water to produce 'biomass'. The biomass can then be converted into 'bio-energy' and other useful forms that are economically viable and environmentally friendly. Carbon-sequestration from marginal areas will have a very big role in the future when scarcity of fresh water will have a significant impact on agriculture and afforestation programs.

The project has different work packages that deal from



Participants of the workshop touring ICBA fields

evaluation of salt tolerant tree germplasms to case study areas in partner countries. Data of these will be overlaid with GIS and image data to identify wastelands in the region and on the global scale. This will quantify the potential of using these wastelands to produce biomass-for-bioenergy.

The meeting was attended by 9 senior scientists from Bangladesh, India, Pakistan and the Netherlands in addition to scientists from ICBA. The workshop discussed the progress of the work, identified the gaps and constraints, and strategies to overcome them. The group looked closely at the fine details of the case study area(s) to extrapolate results on a larger scale. Deliberations were held in detail on the economics of using such wastelands, the potential markets for the products, and the technologies to convert biomass into useful products.

The annual meeting of the project will be held in May 2009.

ROUND TABLE MEETING FOR THE MIDDLE EAST-ARAB REGION

Participants of the *Round Table Meeting for the Middle East-Arab Region* visited ICBA on 25 August. More than 60 representatives from a number of development research and financial institutions, such as the OPEC Fund for International Development (OFID), FAO, ICARDA and the Saudi Fund for Development, toured ICBA facilities and had long discussions with the Center's management and scientists.

Ambassador Ali Mchumo, Managing Director of the Common Fund, says, "The success of the 2008 meeting in Dubai, in terms of raising awareness and public attention to a number of important issues related to the ongoing food crisis; and the indications that member countries in the region are now reassessing their policies to find durable solutions to boost investments in agricultural productivity, is very gratifying to the Fund."

The Meeting was organized with the assistance of the UAE's Ministry of Environment and Water and was held in Dubai from 24 to 25 August 2008.



Participants of the meeting at ICBA

SEED PRODUCTION, CROP MANAGEMENT AND PRODUCTION CONSTRAINTS FOR SELECTED SALT-TOLERANT FORAGES

During their meetings in Damascus, Syria on 9-12 March 2008, the Steering and Technical Committees of the seven-country forage project agreed on organizing several capacity building workshops for the staff of the participating countries. These workshops aim at providing specialists and technicians from Jordan, Oman, Pakistan, Palestine, Syria, Tunisia and the UAE with techniques and knowledge to move ahead in achieving the project's goal to *Raise the incomes of the rural poor in the region.*

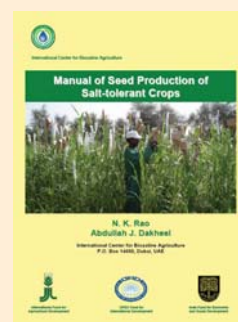


Participants of the workshop during field visits

In order to achieve this goal, and in collaboration with the Syrian General Commission for Scientific Agricultural Research (GCSAR), ICBA organized a regional workshop on *Seed production, crop management and production constraints for selected salt-tolerant forages* on 19-22 October 2008. Project Coordinator, Dr Abdullah Dakheel, Dr NK Rao, Plant Genetic Resources Specialist, and Eng Abdul Qader Abdul Rahman, also from ICBA, participated in the workshop. The workshop included lectures and a visit to Deir-Ezzor for a field demonstration and hands-on training at the project site.

ICBA distributed to participants a *Manual of seed production of salt-tolerant crops* prepared by Drs Rao and Dakheel.

The project is funded by the International Fund for Agricultural Development (IFAD), the OPEC Fund for International Development (OFID), and the Arab Fund for Economic and Social Development (AFESD).



INTERNATIONAL WATER CONFERENCE

The 3rd International Conference on Water Resources and Arid Environment 2008 and the First Arab Water Forum was held in Riyadh, Saudi Arabia on 16-19 November 2008. Organized by the Arab Water Council, Ministry of Water and Electricity, Prince Sultan Bin Abdulaziz International Prize for Water, Prince Sultan Center for Environment, Water and Desert and King Saud University, the event included the awarding of the 3rd Award of the Prince Sultan Bin Abdulaziz International Prize for Water.

ICBA's Deputy Director General, Dr Ahmad Almasoum, represented the Center and the Arab Water Academy at the conference.

AWA EXPERTS CONSULTATION MEETING

In collaboration with Environment Agency - Abu Dhabi, Arab Water Council and the World Bank, ICBA organized on 13-15 December 2008 in Abu Dhabi an *Experts Consultation Meeting* to develop the *Arab Water Academy Learning Program 2009*.

Experts from the World Bank, the Netherlands Institute of International Relations, University of Washington, Human Culture Academy, Stockholm International Water Institute, IWMI, InWent, National Water Resource Center in Egypt, ACSAD, EAD and ICBA participated in the extensive discussions during the workshop. Four programs on water governance, utilities reform, non-conventional water resources and water diplomacy were identified for 2009 and detailed programs were prepared.

MANAGING DEMAND ON IRRIGATION WATER

Under the patronage of H.E. Dr Rashid Bin Fahad, Minister of Environment and Water, the Ministry of Environment and Water (MOEW) of the United Arab Emirates and ICBA organized jointly a seminar on 27 November about *Managing demand on irrigation water*.

Around 40 experts from MOEW, Environment Agency - Abu Dhabi (EAD), Dubai Municipality, Abu Dhabi Municipality and Nakheel and other companies of the private sector in the UAE attended the seminar. Lectures were presented by representatives from MOEW, ICBA, EAD, International Center for Agricultural Research in the Dry Areas (ICARDA), Dubai Municipality and Nakheel.

ICBA'S CALENDAR IS OUT

ICBA's 2009 wall calendar features photographs of some native plants in the Arabian Peninsula. The text is rendered into English, Arabic and French.



SOIL INFORMATION BREAKTHROUGH IN ABU DHABI

NEW SOIL INFORMATION FOR THE INTERNATIONAL SOIL SCIENCE COMMUNITY

Dr S Shahid¹ and Dr M Abdelfattah²

Groundbreaking news

In a world first, soil scientists at the International Center for Biosaline Agriculture (ICBA) and Environment Agency - Abu Dhabi (EAD) have described anhydrite soils to the international soil science community. The unexpected discovery occurred during the recent soil inventory of coastal lands in the Abu Dhabi Emirate.

The inventory revealed thirteen different soils at the soil family level of the soil taxonomy (ST) of the United States Department of Agriculture (USDA). Among these, an anhydrite (CaSO₄) rich soil was mapped over a large area. The next challenge was to assign a taxonomic name to the anhydrite soil using the USDA soil taxonomy. As anhydrite had not been reported previously in any category, it was initially classified under the gypsic soil category.

Gypseous and anhydrite soils

Gypseous soils (CaSO₄·2H₂O) are well recognized in world soil literature. Based on its purity and commercial value, gypsum is commonly used in agriculture to offset sodicity problems by improving soil structure. However, there are many differences between gypseous and anhydrite soils, for example, anhydrite (38.4 meq/l) is more soluble than gypsum (30 meq/l). In a sodic or saline-sodic soil, gypsum and anhydrite react as below:



Formula weight of gypsum (CaSO₄·2H₂O) = 172 g

Formula weight of anhydrite (CaSO₄) = 136 g

The USDA staff were interested to explore why anhydrite does not convert to gypsum even when wet, although the anhydrite rich layer is found above a highly saline water table. Another property in favor of anhydrite is that it is 21% lighter in weight than gypsum. The relatively high solubility and light weight of anhydrite compared to gypsum means that its use is more economical and effective as less material and time will be required for reclamation, thus providing benefits to farmers.

Anhydrite soil became the focus of the international soil science community when ICBA, EAD and USDA scientists for the first time published an article in 2007 about anhydrite soil in a peer-reviewed USDA publication 'Soil Survey Horizons' with the news about anhydrite being highlighted on the front cover: **Anhydrite - really.**



Anhydrite soil and the associated landscape

¹ Soil Scientist, ICBA, (s.shahid@biosaline.org.ae)

² EAD Soil Scientist on Secondment to ICBA (m.abdelfattah@biosaline.org.ae)

Proposal to the USDA

To ensure recognition of anhydrite soil, ICBA and EAD scientists have submitted a formal proposal to the USDA to consider a future change of the soil taxonomy at only three different levels. This is possible as the USDA Soil Taxonomy has been continuously upgraded since its first publication in 1975 through the addition of new orders, suborders, great groups and sub groups.



Anhydrite soil originally found

The following paragraphs should be read in the context of the USDA Soil Taxonomy (ST).

Proposal 1: Anhydrite mineralogy family class

Introduction of an anhydritic soil mineralogy family class in ST that would key out prior to the gypsic family class. This anhydrite class would be applied where anhydrite is the dominant mineral in soil matrix and gypsum is either absent or in traces.

Proposed change in Family Class:

C. Other mineral soil layers or horizons, in the mineralogy control section, in all other mineral soil orders and in Terric subgroups of Histosols and Histels that have:

- 1.a. Any particle-size class and more than 40 percent (by weight) carbonates (expressed as CaCO₃) plus anhydrite, with or without gypsum, and with anhydrite constituting more than 35 percent of the total weight of carbonates plus anhydrite+gypsum, either in the fine-earth fraction (less than 2mm) or in the fraction less than 20 mm in size, whichever has a higher percentage of carbonates plus anhydrite+gypsum.

Or

- 1.b. In the absence of carbonates with sufficient quantities of both anhydrite & gypsum - the mineralogy at the family level should be identified such as more than 50% anhydrite+gypsum measured by acetone precipitation method with a predominance of anhydrite in that mixture by XRD analysis (see Soil Survey Horizons 48:75-79 (2007)).

Anhydritic

2. Any particle-size class and more than 40 percent (by weight) carbonates (expressed as CaCO₃) plus gypsum+anhydrite, with gypsum constituting more than 35 percent of the total weight of carbonates plus gypsum+anhydrite, either in the fine-earth fraction (less than 2mm) or in the fraction less than 20 mm in size, whichever has a higher percentage of carbonates plus gypsum+anhydrite.

Gypsic

Or

- Any particle-size class and more than 40 percent (by weight) carbonates (expressed as CaCO_3) plus gypsum+anhydrite, either in the fine-earth fraction or in the fraction less than 20 mm in size, whichever has a higher percentage of carbonates plus gypsum+anhydrite.

Carbonatic

This change in the soil mineralogy family is needed due to the absence of guidelines in ST to:

- classify soils rich in anhydrite in horizons that is overlying salic & gypsic horizons.
- place soils rich in anhydrite with an upper boundary within 1 meter of the surface and with an overlying salic horizon (no gypsum). Currently, soil scientists classify the soil as Gypsic Aquisalid since no anhydritic diagnostic horizon in ST. Thus, the closest type of diagnostic horizon is Gypsic. Case (a) and (b) present the same soil type, but (b) is different due to the absence of gypsic horizon.

Proposal 2: Anhydritic diagnostic horizon

Introduction of Anhydritic diagnostic horizon in ST. The criteria will be as follows:

Anhydritic Horizon: The anhydritic horizon is an illuvial horizon in which secondary anhydrite has accumulated to a significant extent.

Required Characteristics: An anhydritic horizon has all of the following properties:

- Is 15 cm or more thick; *and*
- Is not cemented or indurated by anhydrite, with or without other cementing agents; is cemented and the cemented parts are less than 10 cm thick; or, because of lateral discontinuity, roots can penetrate along vertical fractures with a horizontal spacing of less than 10 cm; *and*
- Is 5 percent or more (by weight) anhydrite and 1 percent or more (by volume) secondary visible anhydrite; *and*
- Has a product of thickness, in cm, multiplied by the anhydrite content (percent by weight) of 150 or more. Thus, a horizon 30 cm thick that is 5 percent anhydrite qualifies as an anhydritic horizon if it is 1 percent or more (by volume) of visible anhydrite and any cementation is as described in 2 above. The anhydrite content (percent by weight) is calculated as the product of anhydrite content, expressed as cmolc kg^{-1} soil (of the fine earth fraction), and the equivalent weight of anhydrite (68), expressed as a percentage.

In this case anhydrite should be the predominant mineral, as gypsum is either absent or in negligible traces and thus, does not qualify for the gypsic horizon. An example can be seen in Fig 3 (Shahid *et al.*, 2007).

Proposal 3: Modification of Subgroup criteria for Aquisalids

The ICBA and EAD scientists' observations have confirmed that horizons rich in anhydrite are common in soils being classified in the Aquisalids great group. Therefore, the scientists are proposing the following modification to the Key to Great Groups for Aquisalids.

Aquisalids

Key to Subgroups

GBAA. Aquisalids that have an anhydritic horizon with its upper boundary within 100 cm of the soil surface.

Anhydritic Aquisalids

GBAB. Aquisalids that have a gypsic or petrogypsic horizon with its upper boundary within 100 cm of the soil surface.

Gypsic Aquisalids

GBAC. Other Aquisalids that have a calcic or petrocalcic horizon with its upper boundary within 100 cm of the soil surface.

Calcic Aquisalids

GBAD. Other Aquisalids.

Typic Aquisalids

Next steps of the proposal

Given these proposed changes to the USDA Soil Taxonomy, the USDA invited ICBA and EAD scientists to present the proposal to the Joint Meeting of the Geological Society of America, Soil Science Society of America, American Society of Agronomy, Crop Science Society of America and Gulf Coast Association of Geological Societies with the Gulf Coast Section of Society of Economic Paleontologists and Mineralogists (SEPM) held in Houston Texas from 6-9 October 2008.

Subsequently two highly experienced soil scientists, Dr Michael A. Wilson and John A. Kelley, visited Abu Dhabi in November 2008 to undertake field work in the coastline of Abu Dhabi Emirate where the anhydrite soil was first mapped. During this field visit a number of soil pedons were investigated through a transect from the tidal flat to a few kilometers inland. The pedons were described in the field, photographed and sampled for further investigation of anhydrite existence in the USDA Soil Laboratory at Lincoln in Nebraska, prior to final acceptance for a change in the soil taxonomy.

The soil scientists at ICBA and EAD are very optimistic about the success of the proposal and believe that the inclusion of anhydrite in the USDA Soil Taxonomy will benefit the international soil science community in the future.

Reference

Shahid, SA, Abdelfattah MA, and Wilson, MA. 2007. A unique anhydrite soil in the coastal Sabkha of Abu Dhabi Emirate. *Soil Survey Horizons* 48:75-79.



John Kelley (USDA-Regional Soil Scientist) investigating anhydrite soil

BOARD MEETING

Mr Fawzi AlSultan chaired on 26 November 2008 the 18th meeting of ICBA's Board of Directors which was held at the Center's Headquarters in Dubai, United Arab Emirates. The Board discussed in details ICBA's achievements during 2008 and the 2009 work plan.



Board members, Dr Mahmoud Solh, ICARDA's Director General (right) and Mr Mohamed Ennifar, Senior Adviser to the Vice President for Operations of the IDB (middle) visiting the research station field with Dr Shoaib Ismail, ICBA Halophytes Agronomist

IFAD PRESIDENT VISITS ICBA

Dr Lennart Båge (third from left), President of the International Fund for Agricultural Development (IFAD) visited ICBA on the 10 November 2008 and met with Mr Fawzi AlSultan, who was at the helm of IFAD from 1993 to 2001, and is now Chairman of the ICBA Board of Directors; Dr Shawki Barghouti, and senior management members.



Discussions covered the Center's projects, in particular the joint forage project which is partially funded by IFAD. Dr Båge was interested in supporting ICBA's new initiatives, especially in Sub-Saharan Africa countries that will help to achieve IFAD's mission in *Enabling the rural poor to overcome poverty*.

RECENT PROJECTS

Water master plan for Abu Dhabi Emirate

Partner: Environment Agency - Abu Dhabi

Duration: 2007-08

Reconnaissance study and soil analysis for desert islands project in Sir Bani Yas, Abu Dhabi

Partner: Tourism Development & Investment Company (TDIC)

Duration: 2008

Irrigation planning and management for the UAE

Partner: UAE Ministry of Environment and Water (MOEW)

Duration: 2008-10

Safe disposal of brine from the reverse osmosis desalination plants of the UAE agricultural farms

Partner: UAE Ministry of Environment and Water (MOEW)

Duration: 2008-10

Management of salt-affected soils and water for sustainable agriculture

Partner: Sultan Qaboos University, Oman

Duration: 2008-09

Marginal water resources assessment and use for growing horticultural crops and fodders in the coastal saline areas of Bangladesh

Partner: Bangladesh Agricultural Research Institute (BARI)

Duration: 2008-09

STAFF NEWS



Mr Ghassan El-Eid, IT & Network Supervisor, left ICBA in December to return to Lebanon. Mr El-Eid joined ICBA in 2002 and has developed and maintained successfully ICBA's networks and IT department.



Mr Tarek Ateya Ali joined ICBA in December as an IT specialist. Mr Ali has a MSc degree in IT and brings wide experience as an IT specialist at the UAE University.



Mr Yousif Salim Hedar joined ICBA in October as a Research Assistant in the Technical Department.



Mr Surya Gotame joined ICBA in June as an Office Assistant.



Mr Kaleem-UI-Hassan Naeem joined ICBA in June as a Soil Assistant in the Technical Department.



Mr Ahmed El-Sayed joined ICBA Abu Dhabi office in September as a Driver.



Mr Abdul Rahiman Moidin Kunhi joined ICBA in October as a Driver.

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