

Retaining crop biodiversity in the face of a civil war

ICARDA (The International Centre of Agricultural Research in Dry Areas) honoured by the Gregor Mendel Foundation for the rescue and conservation of genetic plant material from Syria



by Olivia Holden, Milling and Grain

On 19th March 2015, Dr Mahmoud Solh, Director General of The International Centre of Agricultural Research in Dry Areas (ICARDA) received the Gregor Mendel Innovation Prize in Berlin, one of the world's top honours for outstanding contributions to plant breeding. In the face of civil war and political insurgency, Dr Solh and his team worked meticulously under difficult conditions in Aleppo, Syria to save and transport genetic plant material to Svalbard Seed Vault in Norway. Most of the germplasm collections that have been transported are unique landraces and wild relatives of cereals and legumes, collected from Central and West Asia, and the North Africa region over the past four decades.

More than 80 percent of the globally unique collection of crop genetic resources has now been safely duplicated at this Arctic facility. The Svalbard Seed Vault has received a total of 116,484 plant genetic materials from ICARDA.

The relentless effort of ICARDA's management and gene bank staff in Syria has contributed to conserving crop biodiversity. The Global Seed Vault in Svalbard, managed jointly by the Global Crop Diversity Trust, the Nordic Genetic Resource Centre (NordGen) and the government of Norway, is serving as an insurance plan in case of a catastrophic global wipe out of crops.

"Safeguarding these genetic materials is a critical mission for ICARDA", says Dr Solh, "we are entrusted with the genetic wealth of some 128 countries - a source that we cannot afford to lose as it ensures long-term public welfare".

Commenting upon ICARDA's commitment to the rescue of genetic plant resources from the gene bank during the political unrest in Syria, Germany's Federal Minister of Agriculture, Christian Schmidt praised the actions of the ICARDA team as a 'grandiose gesture of humanity'. He emphasised that gene banks are not museums of history but instead form the basis for further

development through breeding and agriculture.

I was able to talk to Dr Solh about his time in Syria, and how the actions of ICARDA have contributed to preserving an invaluable treasure of seeds from indigenous crops in the world's dry areas.

ICARDA in Syria

ICARDA was first established in 1977 with its founding mandate to promote agricultural development in the dry areas of developing countries. Initial intentions were to set up a main centre or research station in Lebanon with a sub-station for low lands in Syria and a sub-station for highlands in Iran at the time of the Shah of Iran. However, the civil war in Lebanon made it difficult to carry out these plans. The organisation we're granted about 1,000 hectares by the Syrian government and set up a head quarters there with a substation in Terbol, Lebanon.

Working in the face of a civil war

Even under regular circumstances, the organisation ensures that they have their germplasm collections in its gene bank duplicated outside Syria in case of fire, earthquakes or other natural disasters. The organisation did not envisage any political unrest or civil war as the host country of Syria was relatively stable and safe.

In March 2011, when the unrest first began in southern Syria, about 87 percent of the germplasm collections in its gene bank had been duplicated. This meant about 28,000 seeds were unduplicated. ICARDA gathered all of the support it could to ensure safe duplication could be carried out within three months. Half of the seeds were sent to Turkey and the other half to Lebanon with the support of the government authorities of both countries.

In Northern Syria, the situation worsened in July 2012. ICARDA began the transportation of seeds and they were moved in December 2012. The mission to transport the seeds meant travelling in dangerous circumstances and was not without

difficulties. The last shipment to Svalbard Vault in Norway was carried out from Syria in February 2014. This was extremely difficult. For security reasons, main roads were too dangerous to use. The routes taken to transport the seeds by road from Aleppo were either to Lattakia to be shipped by sea or to Damascus, then to Lebanon.

During the centre operations, unfortunate security circumstances prevailed. The manager of the research station at Tel Hadya and a leader of the group in Aleppo were kidnapped twice but both were safely returned. A Syrian doctor of veterinary medicine was kidnapped when moving sheep and goats to Damascus. He was released from the first kidnapers but currently remains unaccounted for.

All expatriates were moved out of Syria and relocated in July 2012. The centre still has 50 Syrian nationals who remain at work in Syria, mostly in the Aleppo and Tel Hadya research stations. Those working in the Tel Hadya main station were employed from small villages. The employees that remain are kept under close supervision with minimum mobility. Staff safety is a top priority. ICARDA keeps in constant contact with them via mobile phone.

Dr Solh explained that so far, the main buildings are still intact but seriously affected. Equipment was moved from Tel Hadya to be stored safely in expatriate vacated apartments in Aleppo in June and July. Looting has occurred particularly in the small ruminant research unit but all valuable equipment has been moved out from Tel Hadya to Aleppo.

Syria and food security

To date, the on-going civil war continues to raise fresh



concerns about food security in the nation. The conflict has seen 6.5 million Syrians become Internally Displaced Persons and another 2.7 million Syrian refugees flee to neighbouring countries (source: The Borgen Project). Rainfall deficits have also meant that the production of wheat – the major staple food of this country, often consumed in the form of bread, has steeply declined. The civil war has ravished the country's production of cereals and further contributed to a major food security problem. 80 percent of Syrian nationals are now food insecure.

Prior to the civil war, Syria was the only Arab country to have achieved food security. The objective of the Syrian government was to ensure that Syria was self-sufficient in wheat. The country was producing up to 4.7 million tons of wheat annually and in good rainy years exporting one to two tonnes of wheat. The country had invested heavily in science and technology and the government was supportive to local rural farmers explained Dr Solh.

Food remained at the centre of the deal ICARDA struck with rebel groups in order to carry out their work. The groups initially



Dr Solh accepts his award on behalf of ICARDA
 Photograph courtesy of ©Gregor Mendel Foundation

demanded money to protect the facility where they were working, however, ICARDA refused. ICARDA were solely interested in maintaining crop rotation as 630 hectares of cereals, (wheat, barely) and food legumes (lentil, faba bean, chickpeas and grass pea) had been planted. The rebel groups were willing to protect the centre as long as part of the produce could be taken (it was negotiated that 50 percent would be taken, however, it was the case more was taken). The rebels originate from neighbouring villages. As the groups constantly change, the security situation is often turbulent and unpredictable. Some of the farmers (who are now rebel fighters) used to collaborate with ICARDA on farm trials and demonstration fields in the past, so they know of ICARDA and its mission to help small farmers

The future in Syria

During their time in Syria, ICARDA maintained excellent relations there with the local people and the Syrian government. The organisation has developed high levels of trust with all collaborating countries over more than 35 years. Almost all countries where ICARDA is collaborating have welcomed scientists to continue carry out their work. Even China and India have invited ICARDA to work in their research stations.

More than 170 special projects are still being completed and staff now safely re-located to where they can implement them. A rational decentralisation strategy has been in place since it was developed in 2012 and approved in 2013 by the Centre Board of Trustees and the CGIAR Consortium Board. ICARDA currently has three main research platforms (Ethopia, India and Morocco). At the same time, the Board has agreed to make Lebanon a temporary headquarters based on an agreement with the Lebanese government.

Thematic Research Locations have been already established in Egypt for high input irrigated agriculture; in Turkey and Central Asia for research on winter wheat and winter barley. There is also a Regional Cereal Rust Research Centre established at Izmir and supported by the Turkish government in addition to a Thematic Research Location in Sudan on heat tolerance for adaptation to climate change.

Public acknowledgement and a global audience

Commenting upon the prestigious award, Dr Solh stated, “we

were honoured, we did not think people were watching whilst we were going about our work to safeguard invaluable germplasm collections that ICARDA had in its gene bank. Our aims were to save a valuable heritage and to promote the importance of the collection, the conservation of which will be essential to enhancing food security and coping with climate change”.

Visits to archaeological sites in both Syria and Iraq demonstrated that crops such as lentils, barley and wheat had evolved in these locations over thousands of years. These crops have extremely desirable traits such as the ability to cope with harsh environmental conditions including excessive drought, high temperature, cold, salinity, diseases and pests.

“It was so rewarding to learn about the Gregor Mendel Foundation Award of Germany and to find that it reflects the interest and the commitment of the international community to conserve plant genetic resources as an important heritage from our ancestors. We feel that the award has opened the eyes of a global community to invest not only in the conservation of genetic resources, but also in their utilisation to contribute to food security, improve the income of the rural poor and to create job opportunities” Dr Solh further added. ☺

With thanks to the Gregor Mendel Foundation and Dr Mahmoud Solh of ICARDA.

About ICARDA

The International Centre of Agricultural Research in Dry Areas (ICARDA) was first established in 1977 in Syria with mandate to work in North Africa, West Asia, Central Asia and non-tropical dry areas in the 1990s. The Centre is supported by the CGIAR with three founding goals:

- Enhance food security in developing countries
- Reduce poverty
- Protect natural resources (including water, bio-diversity, and the protection of land from degradation)

ICARDA works with a tight focus on the problem solving needs of poor farmers. Although global food production has increased by 20 percent in the past decade, food insecurity and poverty remain widespread, while the natural resource base continues to decline.