“The public may not have noticed. But some people did!”

Mahmoud Solh led the rescue of a major genebank from war in Syria

Many people would regard improving dryland crops as responsibility enough on its own. However, Dr. Mahmoud Solh* and his team at ICARDA** were based in Syria. Heroically, they managed to rescue large numbers of vital genebank accessions from the civil war there. Following a prestigious award*** for this mammoth task, we asked Mahmoud to tell us more.

Syngenta Foundation: How would you describe the essence of ICARDA’s work?

Mahmoud Solh: ICARDA improves the productivity of major agricultural production systems in dry areas. We provide smallholders with better crop varieties and help them improve their farming practices. A further important focus is on the best integration of livestock, rangeland and crops. Our overall aim is to strengthen food security, improve farmers’ income and livelihoods, and protect natural resources in dry areas.

Why is this work so important?

The future availability of enough food for an increasing world population depends heavily on our ability to improve the productivity of major crops. There is also a need to breed farm animals that are better able to withstand drought, heat, diseases and insects. It is crucial that improved agricultural technologies are made available to small and medium-sized farmers, because they produce 80% of the food in developing countries. It is also essential that we take special care of the often fragile ecosystems in dry areas.

What do you personally find particularly fascinating about ICARDA’s work?

For me, the most rewarding aspect is working with, and for, poor farming communities to improve their income and living standards.

What are the major barriers to improving the lives of smallholders in dry areas?

Natural resource degradation is a huge problem. But there are also often problems transferring affordable and adaptable new technologies to rural communities.

The ICARDA genebank holds some 150,000 accessions from 128 countries. How and when did they come together?
ICARDA was established in 1977. As successor to the Ford Foundation’s Arid Land Development Program, it inherited ALAD’s collections of winter cereal, food legume and forage germplasm. It also received around 30,000 accessions from genebanks in the USA, Russia, Italy and elsewhere. Over the following years, these institutions added about another 22,000 accessions. Since 1977 ICARDA has also organized almost 250 collecting missions with national programs, mostly in developing countries. These have secured more than 60,000 often unique accessions of landraces and wild relatives. We also hold elite germplasm and genetic stocks for ICARDA scientists and partners. Two-thirds of our germplasm collections come from dry areas.

How many of these accessions have led to new varieties being delivered to smallholders? What role do crops’ wild relatives play?

National programs have released about 980 varieties from their partnerships with ICARDA. Most of these carry advantageous genes transferred from a range of resources. The wheat mega-variety Verry is a case in point: it has about 50 parents, most of them landraces. We use wild relatives to a lesser extent, but their contribution is still significant in many crosses. Wheat varieties with “1B/1R translocation”, for example, cover most of the acreage in major wheat growing areas of the developing world. Wild relatives in our genebank have provided many desirable traits for high yield and agronomic features. They are also important for resistance or tolerance to abiotic stresses like drought, heat, cold or salinity, as well as biotic ones such as diseases, insects and parasitic weeds.

With the war in Syria, some people feared that the ICARDA collection would be totally destroyed. Germany’s Gregor Mendel Foundation has now honored you for its rescue. How did you and your team achieve this heroic task?

Over the years, ICARDA had managed to safety-duplicate most of its genebank collections outside Syria. When the conflict there escalated, we sped up the duplication and secured 100% of the germplasm collections abroad, including the unique accessions. We also sent seeds to the Svalbard vault, which now holds over 80% of the ICARDA germplasm collections. I’m also glad to say that ICARDA had earlier rescued and safety-duplicated germplasm collections from Afghanistan and Iraq.

Which main crops did you save?

It’s not all about crops. The 147,000 rescued accessions include 1380 strains of rhizobium soil bacteria. There are also about 580 species of cereals, legumes, forages and rangeland plants. These include bread and durum wheat, barley, chickpea, faba bean, lentil, grasspea and field peas.
In Europe, there has not been much public recognition of the rescue work. Why is this? What about in other parts of the world?

The general public may not really have noticed. But people who rely directly on the availability of genetic resources have highly appreciated ICARDA’s efforts to rescue the accessions. I suspect that appreciation is greatest in countries that have particularly suffered from loss of genetic resources.

Your last delivery to Svalbard was in March 2014. Are the remaining 20% of ICARDA’s collection now lost forever?

Not at all. We have prepared more shipments to be sent soon. The remaining accessions require multiplication and regeneration before going to Svalbard.

What has happened to the ICARDA staff in Aleppo?

So far, most of our genebank employees continue to work on cleaning the seeds, packaging them for distribution and monitoring the storage facilities.

*Dr Mahmoud Solh* became Director General of ICARDA in 2006. He has been associated with international agricultural R&D in dry areas since joining the Ford Foundation’s Arid Land Agricultural Development program in 1972. Solh is a former Director of the FAO’s Plant Production and Protection Division. Before that he worked for ICARDA in a range of positions and from 1980-86 was a professor of Genetics and Plant Breeding at the American University of Beirut in his native Lebanon. He holds a PhD in Genetics from the University of California, Davis.

**ICARDA**, the International Center for Agriculture Research in the Dry Areas is a member of the Consortium of International Agricultural Research Centers, CGIAR. ICARDA has been temporarily headquartered in Beirut since leaving Aleppo, Syria, in 2012. It has research centers and offices in a further 16 countries. [www.icarda.org](http://www.icarda.org)

*** On March 19, Germany’s [Gregor Mendel Stiftung](http://www.gregor-mendel.de) (see that foundation’s link in our text above) awarded Mahmoud Solh its 2015 Innovation Prize.