



Partnerships for sustainable agricultural development

ICARDA pursues science-based solutions to meet the national agricultural development needs in Lebanon through partnerships and collaborative research activities. This commitment to explore and support science-based pathways to strengthening food security and improving livelihoods dates back more than four decades.

ICARDA relocated its headquarters to Lebanon in 2012 due to the conflict in Aleppo in Syria, where the organization had been based since 1977. Extended partnerships with the Lebanese Ministry of Agriculture, the Lebanese Agricultural Research Institute, and the American University of Beirut allow for a continued and solid research infrastructure.

Today, ICARDA's main office is in Beirut with scientific activities anchored in four research stations in the Central Bekaa Valley: Tel Amara, Haush-Sneid, Kfardan, and Terbol, hosting the genebank as part of world-renowned facilities supporting national and global science programs. The work in Lebanon links to national institutions and other national research partners across Central Asia, West Asia, and North Africa.

Capacity strengthening is core to ICARDA's work in Lebanon. By training Lebanese scientists, researchers, technicians, students, and farmers, ICARDA helps to deliver quality research and development impact, and ensures that agricultural investments are country-led and sustainable.

Key facts: Agriculture in Lebanon

Country surface: 10,452 km²

Arable land: Around 18% with most fertile areas along the coastal strip and in the Bekaa plane

Population: 4.6 million of which 25% are involved in agriculture

GDP: Agriculture 5%; services (commerce, tourism, banking, and education) 80%; industry 15%

Trade: Imports estimated at US\$23.1 billion (2017), exports at US\$2.8 billion. Food imports are 6% of all imports and 16% of total exports

Major crops: Fruits (47% of agricultural production) and vegetables (23%)

Ideal research settings

The research stations in Bekaa Valley offer ICARDA researchers three different agro-climatic zones – Mediterranean, coastal, and semi-arid – in which they can test and screen germplasm for physiological and agro-climatic conditions similar to those of dry areas worldwide. For global drylands research, these are ideal settings for screening crops for tolerance to mild cold, drought and heat stresses, and resistance to key crop diseases and insect pests.

Terbol Research Station is the largest of the four research stations. It spans 30 hectares of land with recently renovated facilities and laboratories. ICARDA scientists here run trials of winter crops, spring chickpea, and summer crops. They perform crossing for plant breeding in cereals and legumes as part of ICARDA's global breeding programs. With the relatively mild summers in Bekaa Valley, two generations can be grown in a year under off-season shuttle breeding, speeding up the breeding process and substantially reducing time required for developing and releasing new crop varieties. The climate is also good for trials of cold nurseries and offseason summer nurseries of cereals and legumes, complementing the work of ICARDA's other research stations. Terbol has become an excellent site for disease screening as well, mainly for durum wheat, bread wheat, and food legumes.

At Terbol and Kfardan, tests focus on germplasm and development of improved production systems of some of ICARDA's mandate crops: barley, lentil, grasspea, and faba bean. Outputs are evaluated in local and regional field trials before dissemination; the sites also try out new technologies in conservation and ensure sustainable uses of natural resources.

Conservation of genetic resources

With the establishment of new gene banks in Lebanon and Morocco in 2016, ICARDA started the process of reconstructing its gene collections (156,000 accessions) in addition to the main genebank in Syria, through intensive regeneration efforts. From the Crop Trust's Vault in Svalbard, 38,000 accessions were obtained and regenerated in 2016 and 2017. An additional 54,000 accessions retrieved from Svalbard in September 2017 are currently being regenerated.

All accessions regenerated in Lebanon and Morocco are split into active and base collections and safety duplicates

for Svalbard and other reliable genebanks. Scientists in Afghanistan and Iraq have received germplasm they had safely stored in the ICARDA genebank. That seed is now helping these countries to regrow their agricultural economies. As of June 2018, ICARDA has around 24,000 accessions in Lebanon and 34,000 in Morocco.

New crop varieties

ICARDA releases germplasm of cereals and legumes in Lebanon. National institutions receive basic genetic material for their breeding programs, and improved varieties for release to Lebanese farmers. More than 30 new high-yielding varieties have been released over the past four decades, including bread wheat, durum wheat, barley, chickpea, lentil, faba bean, and forage legumes.

Capacity building

Between 1978 and 2017, ICARDA has provided individual degree, non-degree, and internship programs to some 750 students and scientists in Lebanon. With the support of Arab Fund for Economic and Social Development, Terbol station has become a regional hub for conducting high-quality research and building capacity of young agricultural professionals in the region. In 2018, with support from the United Nations Development Programme (UNDP), ICARDA held a training course on livelihood strategy and community building for sustainable agriculture for 22 Syrians, including 12 women who came from the Syrian Ministry of Agriculture and UNDP. It also conducted training for 13 people from Afghanistan with support from Japan International Cooperation Agency on genebank management.

National seed security and advisory services

ICARDA supports the national seed program, contributing to the establishment of a national seed stock in Lebanon with services for farmers, including multiplying and distribution of a range of quality-stamped wheat seeds at a fair price. Advice on planting times, weather updates, and other information is broadcast weekly to the country's farmers by mobile phone text messages. ICARDA is working with Lebanese Agricultural Research Institute (LARI) on improving services to farmers to cover other strategic crops in Lebanon. Two noticeable successes for the partnership have been the production of the largest amount of wheat improved seeds (8,000 tonnes); and all the smallholder farmers that have been helped to access quality seeds at affordable prices.

Early warning systems

ICARDA continues to work with national stakeholders and farmers to reduce the risk of crop losses resulting from epidemic diseases. An intensive screening program run from the Terbol Research Station helps identify and discard susceptible advanced material before it is released to farmers. In addition, it conducts regular surveys to monitor potential major crop diseases in Lebanon.

2018: Survey for wheat rusts covering South Lebanon, coastal areas and Bekaa Valley.

2013 and 2015: Surveys for lentil diseases in Bekaa Valley and South Lebanon. Diseases recorded were ascochyta blight (20% incidence) and wilt root rots (5-10% incidence).

At a glance: Key collaborative research and capacity building activities and priorities in Lebanon

ICARDA program on Biodiversity and Crop Improvement

- Crossing in open fields and greenhouses
- Summer season (off-season) plant breeding
- Doubled haploid breeding
- Screening for resistance to biotic and abiotic stresses
- Evaluation for yield potential under favorable conditions
- Seed health testing
- Seed multiplication and preparation of international nurseries
- Genetic resources evaluation and ex-situ conservation
- Capacity building and training of national and regional national agricultural research systems

ICARDA program on Resilient Agricultural Livelihood Systems

- Small ruminant management
- Testing spineless cactus lines under Bekaa Valley conditions

ICARDA program on Water, Land Management and Ecosystems

- The use of gray water in home farming
- Water and livelihood initiatives in Al-Qaa
- Agricultural support for refugee host communities in Qab Elias

2001-2002: Survey on barley: yellow striate mosaic virus affecting cereals.

1991-1994: Survey on wheat: yellow rust on bread wheat, legume nematodes, and viruses.

The Lebanese Agricultural Research Institute

The Lebanese Agricultural Research Institute is ICARDA's main national research partner. It has hosted ICARDA in Terbol and Kfardan research stations since 1978. The Institute is the official governmental institution responsible for variety release and seed multiplication for farmers. Since 2012, ICARDA's work on food legume pathology has been accommodated at the Lebanese Agricultural Research Institute's headquarters in Tel Amara. At Terbol Research Station, the collaboration involves the management of ICARDA's flock of 125 improved dairy Awassi sheep transferred from Aleppo in Syria.

With the adoption of the new national seed policy and law in 2010, the Lebanese Agricultural Research Institute was tasked with driving forward a national initiative to provide better access to quality seed, starting with wheat. ICARDA has been instrumental in enabling national wheat seed stocks to grow from 1,000 to 8,000 tonnes making Lebanon self-sufficient in wheat seed production. The strategic partnership between ICARDA and LARI, as well as with other national institutions has led to the organization of annual coordination and planning meetings. During these meetings, the results of collaboration are

Key partners in Lebanon

Governmental institutions: Ministry of Agriculture, Lebanese Agricultural Research Institute, Green Plan, and the National Council for Scientific Research

Universities: American University of Beirut, The Lebanese University, Saint Joseph University, Holy Spirit University of Kaslik

International organizations: Food and Agriculture Organization of the United Nations (FAO), Japan International Cooperation Agency (JICA), United Nations Development Program (UNDP), United Nations Economic and Social Commission for Western Asia (ESCWA)



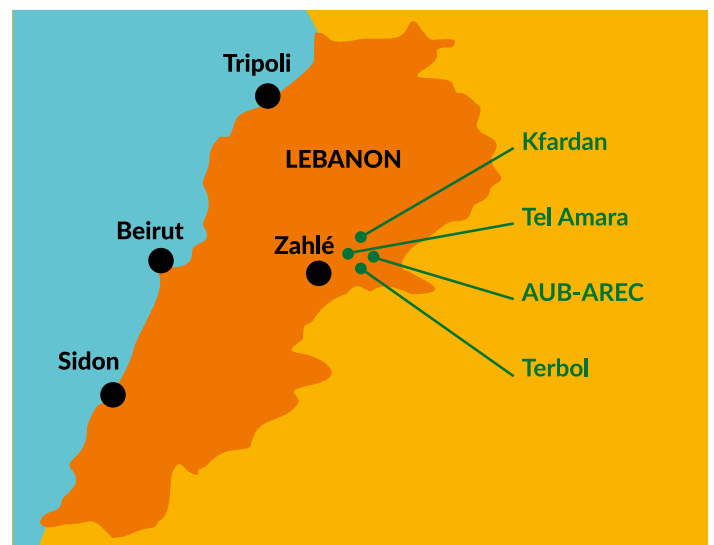
presented and evaluated and future priorities and their action plans are developed. Such consultative processes have helped to embed the partners' ownership of the national system and have led to continuous growth in the partnership's projects.

The American University of Beirut and the Faculty of Agricultural and Food Sciences

The partnership between ICARDA and the Faculty of Agricultural and Food Sciences of the American University of Beirut has evolved in recent years. The American University of Beirut's research facility, Advancing Research Enabling Communities Center – known as the AUB-AREC Farm – in Haush-Sneid in Bekaa hosts four ICARDA staff, including an international seed specialist. The Genetic Resources Section guides scientific efforts related to seed multiplication and creation of international nurseries that dispatch seeds to partners and organizations across the world, and work on seed rejuvenation with ICARDA's genetic resources.

Donors supporting ICARDA's work in Lebanon (as of 2018)

- Arab Fund for Economic and Social Development
- Ceva Santé Animale
- CGIAR Genebank Platform
- CGIAR Research Program, Grain Legumes and Dryland Cereals
- The Crop Trust
- Food and Agriculture Organization of the United Nations
- Government of Japan
- Grain Research and Development Corporation – Australia
- HarvestPlus
- International Fund for Agricultural Development
- New South Wales Department of Primary Industries
- United Nations Development Programme



ICARDA/NARS research stations in Lebanon.

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