

Using wild relative species to deliver climate-smart crops to farmers in drylands

ICARDA partners with the Crop Trust to develop durum wheat, barley, and lentil varieties in Morocco, Lebanon, Ethiopia and Senegal

Rabat, Morocco – ICARDA and the Crop Trust signed a partnership agreement to transform elite material derived from wild relatives of durum, barley, and lentil into cultivars for farmers in the harsh drylands of the Middle East and North Africa. The crosses derived from wild relatives can provide sufficient adaptation and plasticity to ensure food security for resource-poor communities in the region.

The three-year project DIIVA-PR, short for “Dissemination of Interspecific ICARDA Varieties and Elites through Participatory Research,” allows ICARDA’s scientists to work directly with farmers in Morocco, Lebanon, Ethiopia, and Senegal, and to conduct experimental trials at field stations. Based on the farmer’s preferences and using fast-track pre-multiplication procedures, the scientists will attempt to generate rapid changes in the old cultivars and improve them.

“In Morocco, we were able to exploit *Triticum araraticum* to generate several durum wheat cultivars that are resistant to Hessian fly, which is a major insect causing serious yield losses in the drylands,” said Ahmed Amri, director of ICARDA’s genebank. “This was the result of a very fruitful collaboration with the National Agricultural Research Institute of Morocco and Kansas State University.”

Additionally, this project will help farmers to access extra-early elite lentil lines rich in iron and zinc content. It will help widen the genetic base of crops like lentil in the farmers’ fields.

For four decades, ICARDA’s genebank has collected, characterized, and conserved a rich collection of wild relative species for distribution. They are used to deliver high-yielding and climate-smart elite germplasm of durum wheat, barley, lentil, and several other crops. Today, ICARDA’s breeding programs rely heavily on wild relatives in the pedigree of the most promising and performing elite lines.

In the case of durum wheat, four out of the 10 varieties released in 2016 and 2017 are the result of direct top-crossing between elite germplasm and wild relatives. The use of wild relatives to build heat tolerance into new cultivars in the Senegal River Basin was widely acclaimed. ICARDA’s barley program has seen similar successes, including the use of *Hordeum spontaneum* and *H. bulbosum* to build novel adaptability to abiotic stresses.

“We will collect the communities’ inputs, and combine them with statistically sound trials to identify the best germplasm, so that they can be pushed into variety release and cultivation,” said Filippo Bassi, ICARDA’s senior scientist and coordinator of DIIVA-PR.

“We agreed on clear set goals, we calculated how much it would cost to achieve them, and Crop Trust was able to secure the funding for us,” Bassi added.

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