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Wild Barley can help improve cultivated varieties

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Alexandria, Alexandria, EGY, 2008-04-10 17:57:11 (IndiaPRwire.com)

Scientists say that wild species of barley can help improve cultivated barley as the wild species are a treasure trove of useful genes.

Prof Brian Steffenson, Professor and Lieberman-Okinow Endowed Chair of Cereal Disease Resistance at the University of Minnesota, says that incorporating some of the genes from the wild varieties into the domesticated barley could increase the range of environments in which the crop can be cultivated.

``Wild species are a treasure trove of useful genes for improving cultivated crop,´´ said Prof Steffenson, who is here attending the 10th International Barley Genetics Symposium, organized by the International Center for Agricultural Research in the Dry Areas (ICARDA) and Bibilotheca Alexandrina.

``Cultivated barley came from wild varieties. When barely was first domesticated some 10,000 years ago the farmers chose a variety in which seeds were non shattering type so that harvesting was easy. So the genetic diversity narrowed down leading to dramatic loss of it,´´ he pointed out.

Prof Steffenson is working on evaluating traits in wild varieties collected from nature and gene banks to look for diversity that has been left behind since first domestication.

Genebanks like that of ICARDA are extremely important to have because they preserve the biodiversity and germplasm of varieties whose habitat has now been destroyed, he said

``Cultivated barely is extremely vulnerable to some diseases and epidemics of pathogens and pests,´´ Prof Steffenson said. ``Some of the wild barley varieties when characterized have been found resistant to Ug99. The Ug99 race of the stem rust has not arrived in America but when it does, it can be devastating.´´

Agriculture scientists are endeavoring to stop the spread of the devastating fungus, which has now been found in Iran. Historically, sporadic epidemics of stem rust, also known as black rust, have plagued wheat production. An outbreak of the disease in North America in the 1950s destroyed up to 40% of the spring wheat crop. The fungus also infects barley.

Stem rust is once again on the move. In 1999, scientists discovered a new strain of the fungus in Uganda, now known as Ug99 that has defeated the resistance in varieties that were resistant to stem rust in the past. Over the past few years, Ug99 has infected crops in North and East African countries and in early 2006 it was found in Yemen.

Prof Steffension said about 30 varieties of wild barley have been identified as having resistance to stem rust, including the Ug99 strain, and all are from ICARDA.

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Also, some of the accessions of wild barley collection from ICARDA planted in Minnesota have survived extremely cold temperatures, which at times goes down to -35 degrees. ``It means that we can put a new gene that can extend the range of environments in which barley can be grown as a winter crop,´´ Prof Steffenson said.

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