



CWR China

Conservation for enhanced utilization of crop wild relative diversity for sustainable development and climate change mitigation



UK-China
Sustainable Agriculture
Innovation Network

About CWR China

CWR China is a collaborative project jointly funded by the UK Department for Environment, Food and Rural Affairs (Defra) and the Ministry of Agriculture of the People's Republic of China (MOA) under the UK-China Sustainable Agriculture Innovation Network (SAIN) initiative. The purpose of this three-year project is to develop conservation and use strategies for crop wild relative (CWR) species of China to secure and provide access to the genetic diversity of the most important wild plant resources needed for food security and sustainable development in China—in particular to mitigate the impact of climate change. The project involves representatives from five partner institutes: The Institute of Botany, Chinese Academy of Sciences (IB-CAS), the China Agricultural University (CAU), the Institute of Crop Science, Chinese Academy of Agricultural Sciences (CAAS), Fudan University in Shanghai, and the University of Birmingham in the UK.

What are CWR and why are they important?

CWR are plant species closely related to crops, including their wild ancestors. They have been used in plant breeding since the early 20th century and have provided vital genetic diversity for crop improvement—for example, to confer resistance to pests and diseases, improve tolerance to environmental conditions, such as extreme temperatures, drought and flooding, and to improve nutrition, flavour, colour, texture and handling qualities. In monetary terms, CWR have contributed significantly to the agricultural and horticultural industries, and to the world economy. China has released many improved crop cultivars utilizing CWR; for example, wild rice has been used to confer cold and drought tolerance to cultivated rice and wild wheat has been used for pest and disease resistance in cultivated wheat.

The International Panel on Climate Change (IPCC) estimates that by 2100, maize and wheat yields will be reduced by 40% at low latitudes and specifically in China, rice yields will decrease by up to 30% unless climate change mitigation is undertaken. CWR are recognized as critical resources for mitigating the impact of climate change because they are likely to provide the genetic diversity and adaptation needed to breed crops with greater resistance to the environmental changes brought about by the changing climate. Exploiting CWR diversity is therefore a key component of any effective climate change mitigation strategy.

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Research objectives and outputs

China is one of the centres of diversity of major food crops such as rice, soybean and banana. The country has a flora of around 34,000 plant species and a large proportion of these may be important as gene donors for crop improvement in the future. The key objectives of CWR China are:

- Production of a full inventory of CWR of China using a systematic approach previously developed and applied in Europe;
- Identification of priority CWR species based on food security, economic importance, use potential for climate change mitigation, and threat status;
- 'Gap' and climate change analysis to identify conservation needs for selected high priority crop gene pools (including rice, soybean, foxtail millet, grape, Kiwi fruit, poplar and citrus fruits);
- Publication of crop gene pool conservation strategies, including briefing papers for policy-makers;
- Evaluation of CWR using novel genomic approaches to provide improved access to CWR genetic diversity for use in crop improvement, with a focus on genes likely to confer adaptation to climate change;
- Development of an online information system to provide access to the CWR inventory and associated conservation and evaluation data.

Anticipated impact

The publication of a full inventory of CWR of China and access to associated conservation and use data will be a major step forward in the global conservation of CWR. As China is one of the world centres of crop diversity, the country's CWR resources are not only critical for food security in China, but in many other countries across the globe. Proposals for conservation action resulting from this research project will be delivered to government and non-governmental bodies responsible for plant conservation and utilization in China. As a world leader in industry and commerce, any concerted actions to secure CWR diversity in China are likely to resonate in many other parts of the world.



For more information please visit:

<http://cwrchina.ibcas.ac.cn>

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