

The Critical Role of Crop Wild Relatives in Ensuring Global Food Security

In a constantly changing climate scenario, ensuring global food security becomes a top priority. With the increasing population and growing challenges in agriculture, scientists and researchers have turned to nature for solutions. One such solution lies in the often overlooked but critically important role of crop wild relatives.

What are Crop Wild Relatives?

Crop wild relatives, or CWRs, are the wild, ancestral forms of cultivated crops that have undergone natural evolution over thousands of years. They are genetically related to important crop species and share similar traits, making them valuable resources for the improvement of cultivated plants.

These wild relatives have adapted to various environmental conditions, developing resilience to pests, diseases, and climate extremes. Their genetic diversity offers a treasure trove of genes that can be incorporated into cultivated crops through breeding programs to enhance their resilience and productivity.



Combating Global Warming: The Role of Crop Wild Relatives for Food Security (Springer Climate) by Duncan Long(1st ed. 2019 Edition, Kindle Edition)

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Text-to-Speech : Enabled
Screen Reader : Supported
Enhanced typesetting : Enabled
Word Wise : Enabled
Print length : 179 pages



The Genetic Treasure Trove

Crop wild relatives possess unique gene pools that are often absent in modern cultivated crops. These genes offer various advantages, including resistance to biotic and abiotic stresses such as drought, pests, diseases, and extreme temperatures.

For example, during periods of drought, wild relatives of major staple crops like wheat and rice may possess genes that enable them to thrive under arid conditions. By incorporating these genes into cultivated varieties, scientists can develop crop varieties that are more drought-tolerant, ensuring stable food production even in water-scarce regions.

Similarly, the genes present in crop wild relatives can help combat pests and diseases that pose significant threats to global food security. By identifying and transferring these resistance genes, researchers can develop crops that are less susceptible to infestations, reducing the need for pesticides and ensuring food production stability.

The Impact of Climate Change

As the planet continues to warm, climate change poses severe challenges to agricultural productivity. Extreme weather events, altered precipitation patterns, and rising temperatures threaten crop yields worldwide. In this scenario, crop wild relatives offer a lifeline, providing genetic solutions to adapt cultivated crops to changing climate conditions.

For instance, rising temperatures can negatively impact grain yields in major cereal crops like maize, wheat, and rice. By accessing the heat-tolerant genes present in crop wild relatives, scientists can create new varieties that are more resilient to higher temperatures, ensuring sustained food production.

Furthermore, as climate change leads to the spread of new pests and diseases, crop wild relatives can offer natural resistance traits that can be bred into cultivated crops to combat these threats. This genetic diversity is essential for maintaining resilient food systems in the face of changing biological challenges.

Conservation Efforts and Access to Genetic Resources

Preserving and accessing the genetic diversity of crop wild relatives is crucial for global food security. However, many of these species are endangered or at risk of extinction due to habitat loss, climate change, and human activities.

Conservation efforts are increasingly focusing on safeguarding the genetic resources of crop wild relatives. Botanical gardens, gene banks, and international initiatives like the Crop Trust are working together to protect and maintain these valuable genetic resources.

Scientists and breeders are also partnering with local communities and indigenous knowledge holders to learn from traditional crop cultivation practices and protect the genetic diversity of locally adapted crops and their wild relatives.

Crop wild relatives play a critical role in ensuring global food security amidst the challenges posed by climate change. Their unique genetic diversity offers a vast array of traits that can help cultivated crops adapt to changing environmental conditions, combat pests and diseases, and sustain food production worldwide.

Preserving and utilizing the valuable genetic resources of crop wild relatives is essential for breeding more resilient and productive crop varieties. Conservation efforts, collaborations between scientists and local communities, and international initiatives are all crucial for harnessing the full potential of crop wild relatives to address the pressing issue of global food security.



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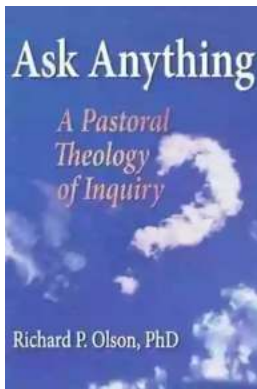


This book critically examines the environmental hazards posed by global warming with regard to future food security, which will depend on a combination of stresses, both biotic and abiotic, imposed by climate change; variability of weather within a growing season; and the development of cultivars that are more sensitive to different ambient conditions. Furthermore, the ability to develop effective adaptive strategies which allow these cultivars to express their genetic potential under changing climate conditions will be essential.

In turn, the book investigates those plant species which are very closely related to field crops and have the potential to contribute beneficial traits for crop improvement, e.g. resistance to a wide range of biotic and abiotic stresses, enriching the gene pool, and ultimately leading to enhanced plant yield, known as

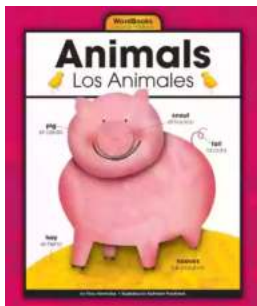
“Crop Wild Relatives” (CWRs). CWRs hold tremendous potential to sustain and enhance global food security, contributing to human well-being. Accordingly, their development, characterization and conservation in crop breeding programs have assumed great practical importance.

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