

**Plant genetic resources and climate change:  
Threats and needs for adaptation through plant breeding**

Mohamad Osman

Department of Crop Science,  
Faculty of Agriculture, UPM, Serdang.

**Abstract**

The need for food will continue to increase during the 21<sup>st</sup> century. By developing higher yielding, disease-resistant and adverse environment-tolerant crops, crop scientists will be at the forefront of the efforts to increase the global food supply. Over the past 50 years, there has been a three-fold increase in agricultural production. The use of high-yielding varieties (HYVs) is the pivot of this significant achievement. However, these varieties need optimum growing conditions to be productive, and the use of fertilisers, pesticides, mechanisation, and irrigation is an integral part of the higher yields. It is well known that plant genetic resources are the building blocks of new and better varieties. The issue of global climate change has become a dominant issue for the world touching on various aspects of human well-being. While many groups claim that the issue is just an exaggerated science-based concern, there are other groups who actively suggest that it is a nonissue, merely one which is political in nature. In just a couple of years back, we have already been witnessing never-before signs of undesirable climate change on agriculture fast becoming a reality, coupled with their adverse economic outcomes. What is the range of possibilities to mitigate the negative impacts of climate change? Can plant breeding offer any plausible strategies to help crops and commodities adapt to or even take advantage of climate change in a long term? In Malaysia, plant breeding efforts have contributed immensely to the development of superior varieties and clones to uplift our major crops and commodities particularly rice, rubber and oil palm. For these priority crops, plant breeders have made significant genetic gains from the well-organised and resourceful breeding programmes, as well as assembled considerable germplasm across the world to broaden their genetic base. However, for many important crops, breeding research to improve them are still inadequate and poorly balanced in terms of priority. In fact, there is still a large number of crops which are either still grappling with meagre plant breeding or virtually not touched by plant breeding. With rapid and gradually imminent temperature rise to aggravate climate change, plant breeding will inevitably be burdened with far more breeding objectives than it has been designed to meet heretofore. Therefore, we need to look imperatively at the considerable significance of plant genetic resources and plant breeding to move agriculture further, and to subdue the negative climate change.

Keynotes: Plant genetic resources, climate change, threats, needs, adaptation, plant breeding.

Corresponding author: mbopar2004@yahoo.com