BIZCOMMUNITY

Climate smart crops: A necessity for future food and nutrition security

By Bev Postma

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Climate change is taking a severe toll on farmers, as they watch their livelihoods disappear with the onslaught of floods, droughts and rising sea levels and temperatures. With agriculture currently employing over 1.3 billion people throughout the world, or close to 40 percent of the global workforce, it is imperative that we incorporate climate resilience into all aspects of crop breeding and food innovation.

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Developing ways to improve staple crops so that they can withstand some of the adverse effects of climate change will ensure food security and agricultural livelihood for generations to come.

Decline in food production

A recent report from the International Food Policy Research Institute (IFPRI) found that at current rates of climate change, it is likely that global food production will decline by two percent every decade until at least 2050, just as the world's population is expected to reach 9.7 billion people.

As a result of these factors, people may be forced to eat fewer fruits, vegetables, and red meat products because their availability may be scarce and prices may rise accordingly. Access to food may also be limited by climate-related vulnerabilities in transportation, storage, and processing.

Projection models from the World Bank likewise show that by the 2030s-2040s, between 40 to 80 percent of cropland used to grow staple crops like maize, millet, and sorghum could be lost due to the effects of higher temperatures, drought, and aridity.

Decreased nutritional quality of crops

At the same time, increased levels of CO2 in the atmosphere are already decreasing the nutritional quality of crops - lowering their concentrations of vital micronutrients like zinc and iron. In a 2014 study on CO2 and crop nutrition, Samuel Myers of Harvard University and his colleagues determined that the CO2 levels in the second half of this century would

likely reduce the levels of zinc, iron, and protein in wheat, rice, peas, and soybeans.

Some two billion people live in countries where citizens receive more than 60 percent of their zinc or iron from these foods. Many already suffer from diets that lack enough of these important minerals, and increased deficiencies of these vital nutrients would have even more devastating health consequences.

A new technology known as biofortification - the process of increasing the nutrient content of staple food crops - is a promising tool in the global effort to mitigate these trends.

Many of the effects of climate change are already being felt. Increased drought and aridity are now a reality in Somalia, Kenya, and Ethiopia, leading to widespread harvest losses and livestock death. As a result, malnutrition levels in the area have skyrocketed. In Somalia alone, the UN says more than six million people are in need of urgent help.

Focusing on crop adaptation strategies

Though climate change continues to progress at an advanced pace, researchers and policymakers can help offset some of the negative impacts on farmers by focusing on crop adaptation strategies. Organisations like HarvestPlus and our global partners recognise the necessity of climate resilience and our scientists, plant breeders, and country teams are working daily to scale out more climate-resilient crops.

At the International Center for Tropical Agriculture in Palmira, Colombia, researchers are developing beans that can "beat the heat." Often referred to as "the meat of the poor," beans offer a crucial source of vitamins and protein as well as income for millions of people, particularly in Africa and Latin America.

But climate modeling suggests that, over the coming decades, higher temperatures will threaten bean production, reducing yields and quality. Moreover, heat stress could diminish the area for growing beans by up to 50% in eastern and central Africa by the year 2050. By identifying elite lines of beans that show strong tolerance to heat - up to 30 degrees Celsius - breeders can develop more productive, nutritionally improved beans that are resilient even in harsh growing conditions.

Indeed, climate resistant traits are integral to all 150 varieties of the 12 staple crops we and our partners have developed. We run extensive tests to ensure crops will be successful, from stress tests in the field mimicking intense climate conditions to studies in laboratories. Under repeatable stress conditions, we generate an environment for testing which allows breeding for climate smart, robust varieties with high micronutrient and high yield stability. The traits bred into our crops are virus, disease and pest resistance, as well as drought and heat tolerance. These selective plant breeding techniques are just one means of securing agriculture in areas vulnerable to climate change, but we have to do more.

As climate change continues to play a dominant role in agriculture and food security, we have to remain committed to continued research to be sure people in rural communities receive the most nutritious and resilient crop varieties available. With ongoing crises of famine in five countries stretching from Africa to the Middle East, farmers and vulnerable populations are relying on policymakers, scientists and aid workers to provide the necessary tools to mitigate hunger and

prevent additional harvest losses.

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