GIPB GLOBAL PARTNERSHIP INITIATIVE FOR PLANT BREEDING CAPACITY BUILDING
harnessing plant genetic resources for development

Tackling Climate Change through Plant Breeding and Better Use of Plant Genetic Resources

Climate change is threatening to push the number of hungry even higher in the decades to come, due to new challenges to agriculture and food production. Temperatures across the world could rise up to 6^{0}C by 2050.
The main challenges from climate change to agriculture and food production are the more frequent and severe drought and floods,and higher pressure from insects and diseases.

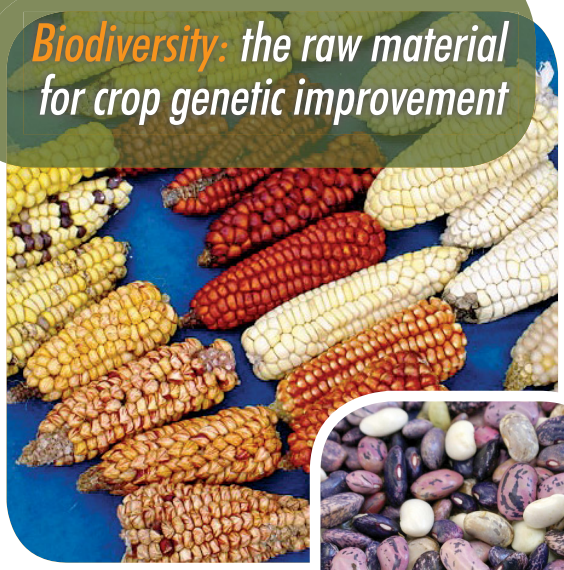
Climate Change: future major challenge for food security

Crop production under drought results in low yield, high production costs and less than desirable agronomic practices. Irrigation, a means to mitigate drought, has its own environmental and economic costs, making it an option not suitable to all scenarios.

One of the effective ways for crop production to grow or at least to stay stable under new challenges from climate change is through improved varieties developed by plant breeding.

The genetic diversity of crop plants is the foundation for the sustainable development of new varieties for present and future challenges. Resource-poor farmers have been using genetic diversity intelligently over centuries to develop varieties adapted to their own environmental stress conditions.

Biodiversity: the raw material for crop genetic improvement



- Common beans biodiversity has been used by plant breeding to develop both heat and cold tolerant varieties grown from the hot Durango region in Mexico to the cold high altitudes of Colombia and Peru.
- Corn genetic resources have been used in breeding varieties adapted to cultivation from sea level to over 3,000 masl, as in Nepal.
- The Sub1 rice tolerant to flood developed by Bangladesh breeders can survive total submersion for more than two weeks, with great benefits to farmers.

- *Plant breeding has been developing varieties for heat, drought and flood stresses, but with more severe and frequent challenges from aggravated climate change it needs extra immediate support to overcome the challenges.*

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Plant breeding is the art and science of genetically improving plants for the benefit of humankind. It is practiced worldwide by professional plant breeders and by farmers, with a proven track record over centuries. Environmental stresses have become more frequent and aggravated by rapid climate change in recent decades, and plant breeding is an essential part of the solution.

Plant breeding can develop varieties to cope with climate change through many different techniques ranging from simply selecting plants in farmers' fields with desirable traits for propagation, to more complex classical or molecular techniques.

Plant Breeding: solution for food security in unfavorable environments

Plant Breeding to Tackle Climate Change

- *Environmentally friendly varieties: Improved varieties resistant to pests require fewer pesticides.*
- *High-yielding varieties: Increase food production per unit area and alleviate pressure to add more arable land to production systems.*

All the wheat, rice, corn or potatoes in our diet come from varieties developed by plant breeders and grown by farmers around the world. With the discovery of genetics, plant breeding became a more reliable means to improve varieties. Now, with a modern biotechnology, a tool used in plant breeding, the development of new adapted varieties has become a more precise and rapid process.

The science supporting plant breeding is advancing rapidly, and with sustained support, plant breeding will make an even greater contribution to feeding the world and tackling Climate Change.

Pest resistant varieties: environmentally friendly

Conclusions

- *Many new improved varieties are environmentally friendly, ensuring food security, while conserving the environment.*
- *Genetic diversity and plant breeding are key elements in tackling climate change, and integration of plant breeding in climate change strategies is one of the best paths to sustainable food production.*

GIPB is a global platform facilitated by the Food and Agriculture Organization of the United Nations
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