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"Agricultural development within the rural-urban continuum"

Vegetable Genetic Diversity Maintained by the AVRDC Genebank – A Cornerstone for Sustainable Production of Nutritious Food

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Abstract

Crop genetic diversity, created through natural and human selection over millennia and complemented by the diversity present in wild relatives of crop plants, provides the raw material that can be employed by scientists to improve crop productivity and diversify production systems. But genetic variation, once considered unlimited, is fast eroding as modern breeding lines replace traditional cultivars over large areas, and natural habitats are destroyed through human intervention. This is especially the case for vegetables; high-yielding hybrid cultivars dominate the seed market and the value chain. AVRDC – The World Vegetable Center maintains a vast diversity of vegetable genetic resources comprising more than 60,000 accessions of 170 genera and 437 species from 156 countries. The AVRDC genebank is one of the world's largest international public genebanks. Since its establishment in 1971, AVRDC has distributed close to 590,000 seed samples of its vegetable germplasm collection to researchers and breeders in 200 countries. Each year the Center's Genetic Resources and Seed Unit distributes seed samples of 6,000 to 7,000 accessions and breeding lines to the public and private sector as well as to AVRDC scientists for crop improvement programs and related research worldwide, thereby contributing to global food and nutrition security. More than 466 improved vegetable cultivars and varieties developed from the germplasm held by AVRDC have been released to farmers around the world, helping them to produce good harvests and generate income despite pest and disease pressure or abiotic stress. One interesting example is tomato, with 169 cultivars based on AVRDC-developed open-pollinated, heat-tolerant and multiple disease-resistant germplasm released in 40 countries worldwide since 1978. About 75 % of seed companies in Asia use AVRDC-developed cultivars as parent lines in their breeding programs. This success was only possible thanks to the genetic building blocks conserved in AVRDC's diverse tomato collection of more than 8000 accessions, including 735 wild species, 595 genetic stocks and more than 6000 accessions of mostly traditional cultivars and landraces.

Keywords: Food and nutrition security, genebank, tomato, vegetable genetic resources

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