

Alternative plant breeding tools using ecogeographical information systems

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Abstract

The present paper reviews the use of ecogeographical (environment) information within the framework of efficient utilization of plant genetic resources. While genotypic information gained a rapid boost, in agrobiodiversity studies during the last two decades, on the contrary the use of environmental information on the collecting sites has taken more gradual steps, while the environment has empirically been considered a key factor by farmers and conventional plant breeders since the emergence of agriculture. Actually, environmental information on the collecting sites (ecogeographical characterization) reveals the adaptive range of species genotypes conserved and identifies the most important environmental factors for adaptation. Utilization of geographic information systems (GIS) helped the progress of ecogeographical characterization and arrangement of environmental data in layers compatible with GIS applications. Geographic information systems are useful to manage and analyse georeferenced data of collecting sites, such as passport collection data and environmental variables, enabling the study of environmental conditions under which crop wild relatives and local varieties have acquired their adaptive traits. All these can improve the efficiency of the typical activities of conservation and the use of plant genetic resources, such as collecting and field explorations, identifying gaps and priority conserved areas, creating core collections or selecting appropriate germplasm for plant breeding programs.

Keywords: ecogeographical characterization, environment, genotypic information.