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Current Aspects of Plant Biology Based on Agriculture

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Plant biology research is now at the vanguard of research in the biological sciences, with breakthroughs in our understanding of basic processes in plants matching those with other organisms. The impact of physiology, molecular genetics and the availability of model crop species can be ensured in all facets of plant biology. The practice of planting different variants of the same crop in adjacent plots to promote the production of hybrid seed is used widely today by farmers and plant breeders, and has probably been practiced for millennia. By inserting genetic material into the plant's normal genome, crop varieties have been developed to resist an array of pest problems using biotechnology tools. As a result, these crops have been grown without using certain pesticides necessary on conventional crops (e.g. Bt crops). In some cases, the biotechnology-derived crop achieves the potentiality to control of plant pests effectively and bio-friendly that is not easily possible by other way. Another hand, biotechnology derived crops are resistant to certain herbicides that injure conventional crop varieties. Planting the biotechnology-derived herbicide-resistant crop has created the opportunity to use the associated herbicide, which often provides effective and less expensive weed control measures.

Abiotic and biotic stresses are foremost factors that restrict agricultural productivity globally. These stresses include high or low temperature, drought, salinity, and diseases, which may act independently or simultaneously [1, 2, 3]. Plant genomics and proteomics are the most powerful tools for identifying the unknown genes for improving the crop cultivars [4, 5]. The completion of reference genome sequencing for many important crops and model plants pave the way for accelerating crop improvement dramatically and in realizing the long-standing promise of plant genomics [6]. Comparative approaches for the identification of functionally important mutations based on analysis of marker frequency among populations had also been important [7], but the high variance in expected allele frequency between populations [8] made the discovery of functionally important variants among the high number of loci surveyed highly implausible.

In conclusion, it is important to point out that food insecurity in large sectors of the developing countries is a consequence of inadequate technological development. The new biotechnologies open an array of opportunities for increasing product diversification based on biodiversity. It is necessary to bear in mind not only the local socioeconomic context, but also world aspect agricultural and biodiversity derived products. In this regard attention has to be taken on different agro-industry based economy, research and technological developments; and different programs under the legal framework to continue stimulating the biodiversity conservation and exploitation. It is also very important to be taken into account the resource-poor farmer to make sure the sustainability of benefits of modern biotechnologies in developing countries.

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