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# IMPACT OF ADVANCED TECHNOLOGY IN PLANT BREEDING

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**P**lant genetics provide a basis for the development of improved varieties against biotic and abiotic stresses while increasing the nutritional values. Incorporation of advanced technology in conventional breeding accelerates the breeding efficiency and plays a key role in increasing food production. Plant breeding is now in the genomic era where inclusion of advanced technologies creates a new horizon. Genome editing has resulted genetically engineered plants which lack the transgene. Antisense or RNA interference technology silence the expression of native gene/s to have desirable expression, targeted methylation of DNA bring heritable changes in gene expression through Targeted Epigenetic Modifications, large scale of genetic data collected by genome sequencing, re-sequencing, next generation sequencing help to breed improved varieties, artificial and synthetic chromosomes enables scientist to construct multigene pathway in a single DNA molecule, non-tissue-culture based transformation used to avoid the effect of somaclonal variation on transgene, and several computational tools used to analyze the genomic data. Various other potential applications of genomics bring a paradigm shift in crop improvement. However, the appropriate incubation period is required to harvest tangible benefit of these technologies. For example, marker-assistant-selection which was introduced in plant breeding in 1980 but user friendly markers were introduced in late 1990 and their wider application was visible 5-6 years back only. Advanced technology in plant genetics increases throughput and provides a molecular basis of traits that enable scientist to establish a genetic correlation between agronomic traits and plant phenotype to develop improved varieties for present and future generation. Future demands for high throughput in field-based phenotyping technologies to provide parallel dataset to increase the efficiency and reduce the cost associated with the breeding activities. It is important that research in genomics continues to grow to provide a rational pathway to develop a systematic tiered approach for the crop improvement.

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