

Biotechnology for agriculture – is it sustainable?

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Abstract

Gene modification for improved crop varieties has been in vogue for centuries. Several plant varieties were selectively bred over hundreds of years into domesticated food plants. A process known as Artificial Fertilization was used wherein an elaborate process involving collection and application of pollen onto the stigma yielded hybrids with desirable traits. Green revolution had brought in plant varieties resistant to biotic and abiotic stresses by carrying out crosses between several related species. A more precise gene manipulation by specifically combining genes from one organism into another commonly referred to as Genetic Engineering came into existence. Plant breeding for pest resistance has been considered the most critical application of genetic engineering. Transgenic crops especially cotton and maize were being developed by inserting genes from *Bacillus thuringiensis* to prevent pests. It is considered that introduction of novel traits with taxonomically different organisms can have intense negative impact on the environment bringing about changes in the genetic makeup of the population.

Keywords: Genetic Engineering, Transgenic, Conventional, Environment, Sustainability

Introduction

Although the first known evidence of genetic modification in plants was observed for wheat varieties dating back to 7800 BC [2], the most popular genetic manipulation in the history has been in maize. Maize initially was a wild grass known as “Teosinte” and the most important characteristic feature of this variety was that it had very few kernels on tiny ears. Several plant varieties were selectively bred over hundreds of years into domesticated food plants and the famous plant hybridization experiments by an Austrian Monk Gregor Mendel are well known. A