Potentials of Genetic Modification

What is the issue?

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Despite the critical views on Genetic Modification (GM), there have been substantial benefits out of it, which needs recognition for further betterment.

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What benefits has the GM technology brought?

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- Bacillus thuringiensis (Bt) in maize and cotton from 1996 to 2015 contributed to a reduction in the gap between actual yield and potential yield.
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- This was under circumstances in which targeted pests caused substantial damage to non-GE (Genetic Engineering) varieties.
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- Also, synthetic chemicals could not provide practical control.
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- But GM technology adoption has reduced pesticide use by 37%, increased crop yield by 22%, and increased farmer profits by 68%.
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- Yield gains and pesticide reductions are larger for insect-resistant crops than for herbicide-tolerant crops.
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- Yield and profit gains are higher in developing countries than in developed countries.
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What is the case with India?

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- **Cotton** - Certainly, Bt cotton is not a failure in India. Farmers continue to grow Bt cotton.
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- The yields hovering around 300 kg/ha at the time of introduction of Bt cotton (2002) have increased to an average of over 500 kg/ha.
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- It has converted India from a cotton-importing country to the largest exporter of raw cotton.
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- There was a small dip for a couple of years and the yield has now increased to over 550 kg/ha.
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- Further, the development of resistance can be tackled through practices like Integrated Pest Management and by stacking Bt genes to fight secondary pests.
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- The priority now is to accelerate development of Bt cotton varieties that can be packed densely in fields.
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- By doing so, yields could be increased to over 800 kg/ha, as is the case with other countries.
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- **Mustard** - GM mustard (DMH-11) is a technology to create mustard hybrids.
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- Being a self-pollinator, mustard is difficult to hybridise through conventional methods.
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- So genetic modification allows different parents to be combined easily, helping yields go up substantially.
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What lies ahead?

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- Genetic engineering technology has opened up new avenues of molecular breeding.
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- However, their potential undesirable impacts will have to be kept in view.

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- What is important is to choose the one which can take the country to the desired goal sustainably, safely and economically.
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- There is scope for further improvement in terms of technology and regulatory protocols for GM technology in India.
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Source: The Hindu

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