

**Allow Golden Rice Now!**



**The Allow Golden Rice Now!** Campaign is a combination of direct action demonstrations and education. Many falsehoods have been claimed by those who fear agricultural technology, resulting in public pressure on governments to ban all GMOs, Golden Rice included.

In order to understand why an exemption should be made to allow Golden Rice it is useful to have a basic knowledge of plant breeding and human nutrition.

To begin, “genetically modified” is a very general term. We are all genetically modified, a random melding of our mother’s and father’s genes. There are many ways to “genetically modify” our food crops.

## Some Useful Terms

**Species** – Organisms that can reproduce with each other and produce sexually viable offspring. Polar bears and grizzly bears are varieties of the same species, for example.

**Variety** (plants and wild animals) and **Breed** (domestic animals)  
A sub-set of a species that has distinct characteristics from other varieties of that species. Cabbage, broccoli, cauliflower, and kale are all varieties of the same species. All domestic dogs are the same species.

**Trait** – An observable and distinct characteristic of a species, such as eye color, growth rate, nutritional content, etc. **Traits** are what agronomists are breeding for to improve food crops.

**Gene** – The DNA unit of a chromosome that produces certain proteins or enzymes that confers a particular trait. All breeding involves the selection of genes.

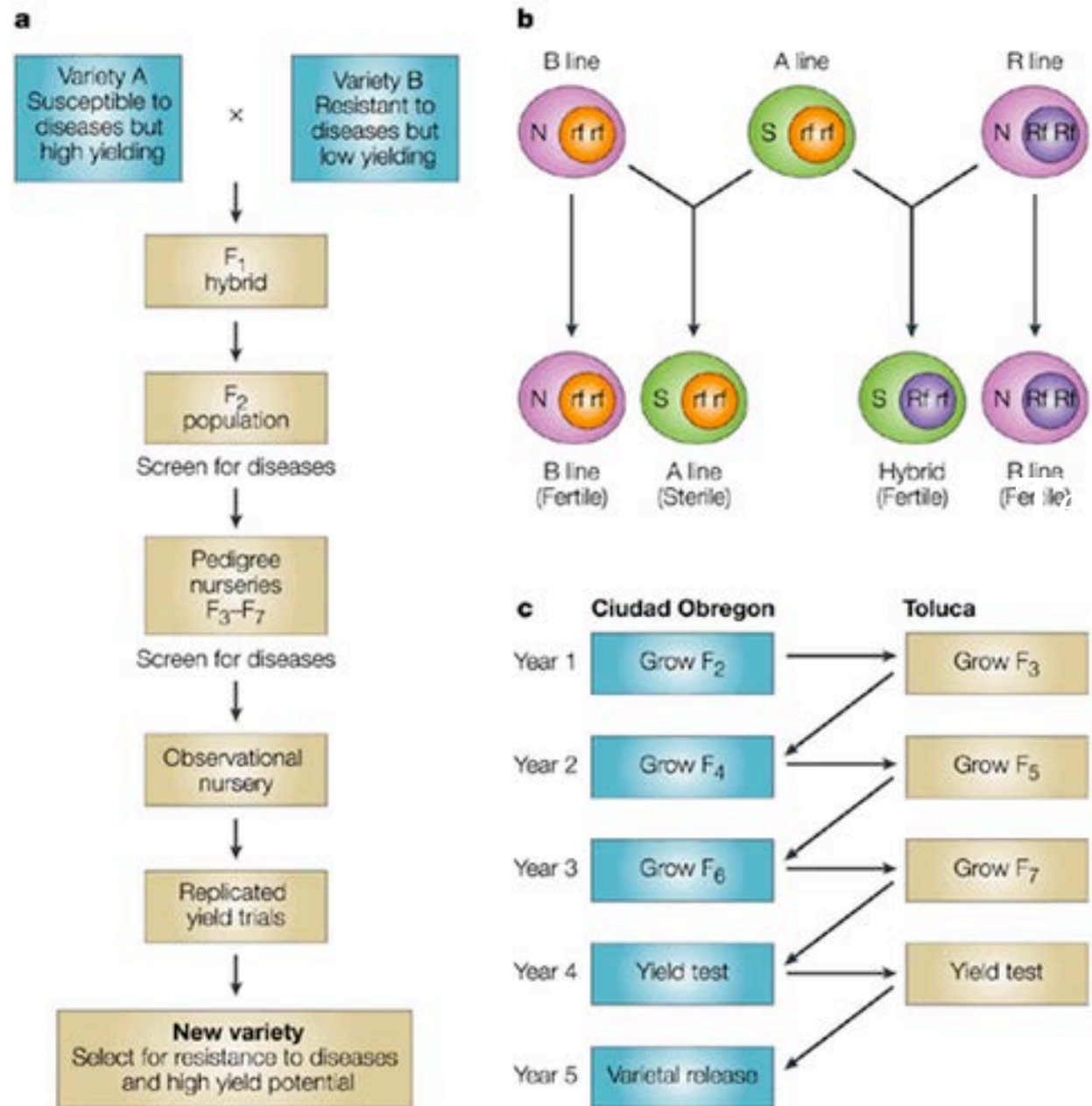
## **Natural Selection in Wild Nature**

**In the wild, species reproduce through natural selection. There is no human control over which individual mates with other individuals.**

**This is similar for humans where individuals have a free choice over who they mate with. We are essentially a wild species in this regard, except for cultures where arranged marriage is prevalent, which is similar to conventional breeding in agriculture.**

**“Horizontal Gene Transfer”, where genes are transferred from one species to another, is relatively common in nature. This occurs without human guidance but is very similar in nature to genetic modification.**

# Conventional Breeding

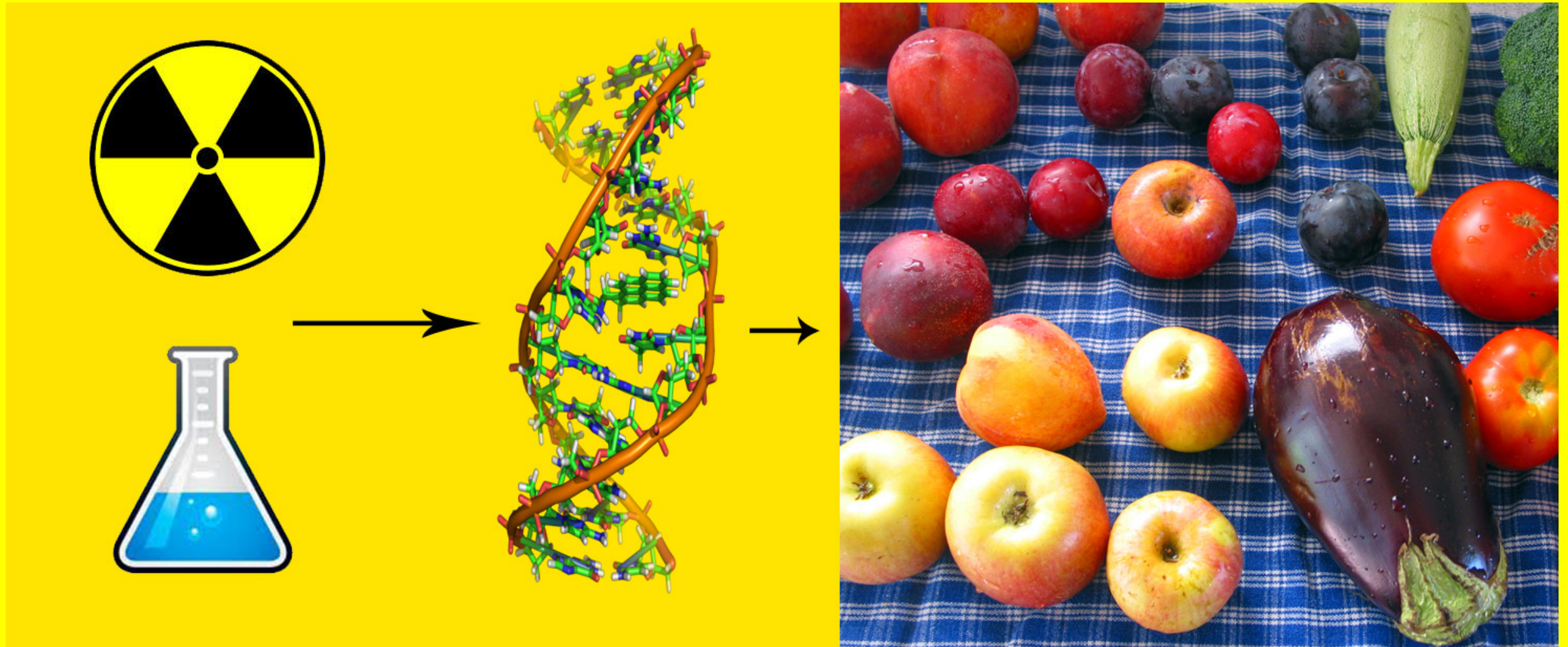


Nature Reviews | Genetics

**Conventional Breeding is like arranged marriage. Individuals with desirable traits are selected and crossed. This is how plants and animals have been genetically modified since agriculture began more than 10,000 years ago.**



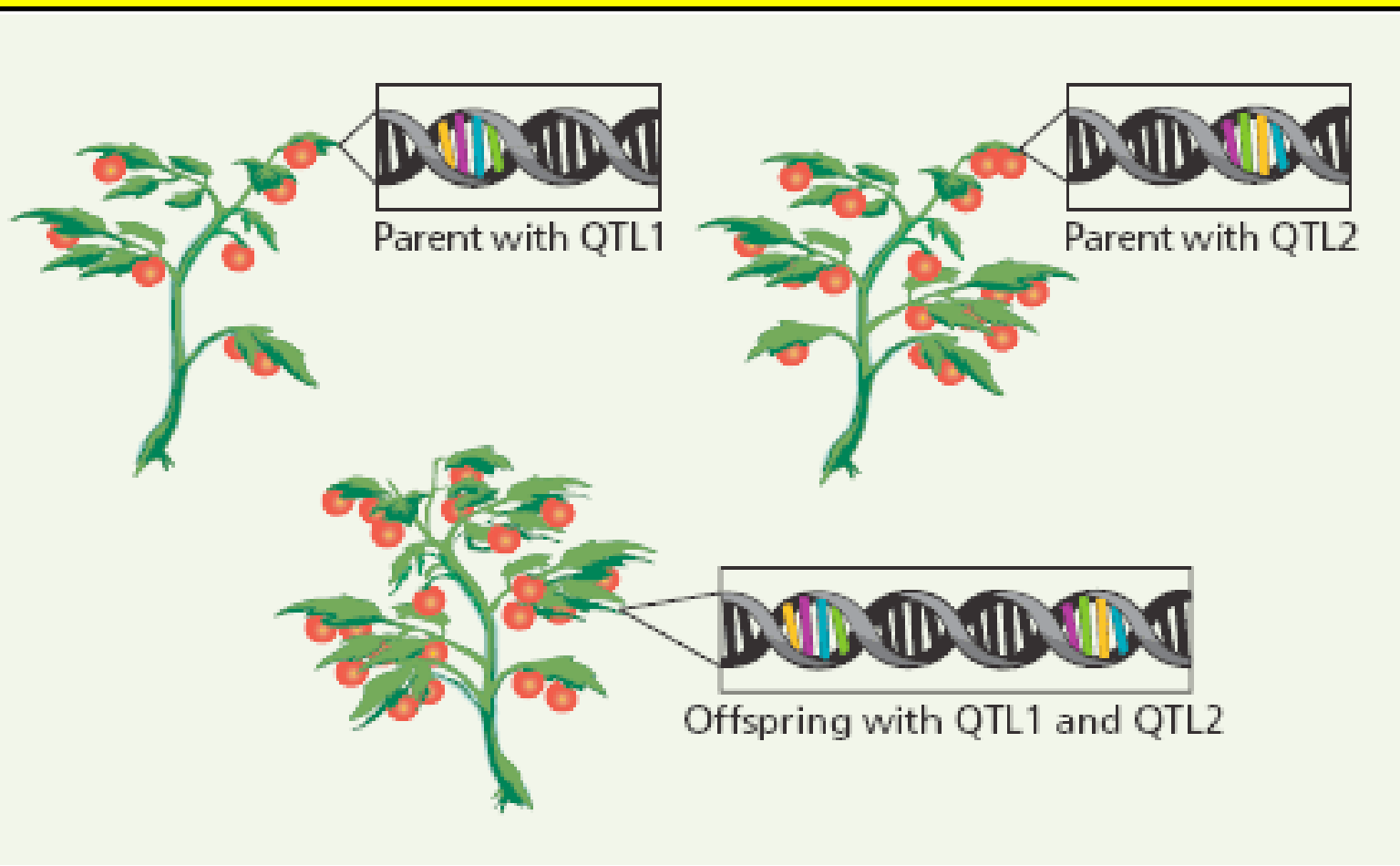
# Mutation Breeding



**Mutation Breeding uses radiation and mutation-inducing chemicals to alter the DNA in seeds. It has been widely used since the 1930' s. Out of millions of treated seeds, perhaps one will have a desirable new trait. Many organic farmers use seeds produced by mutation breeding. There is no guarantee that undesirable traits will not also be induced.**

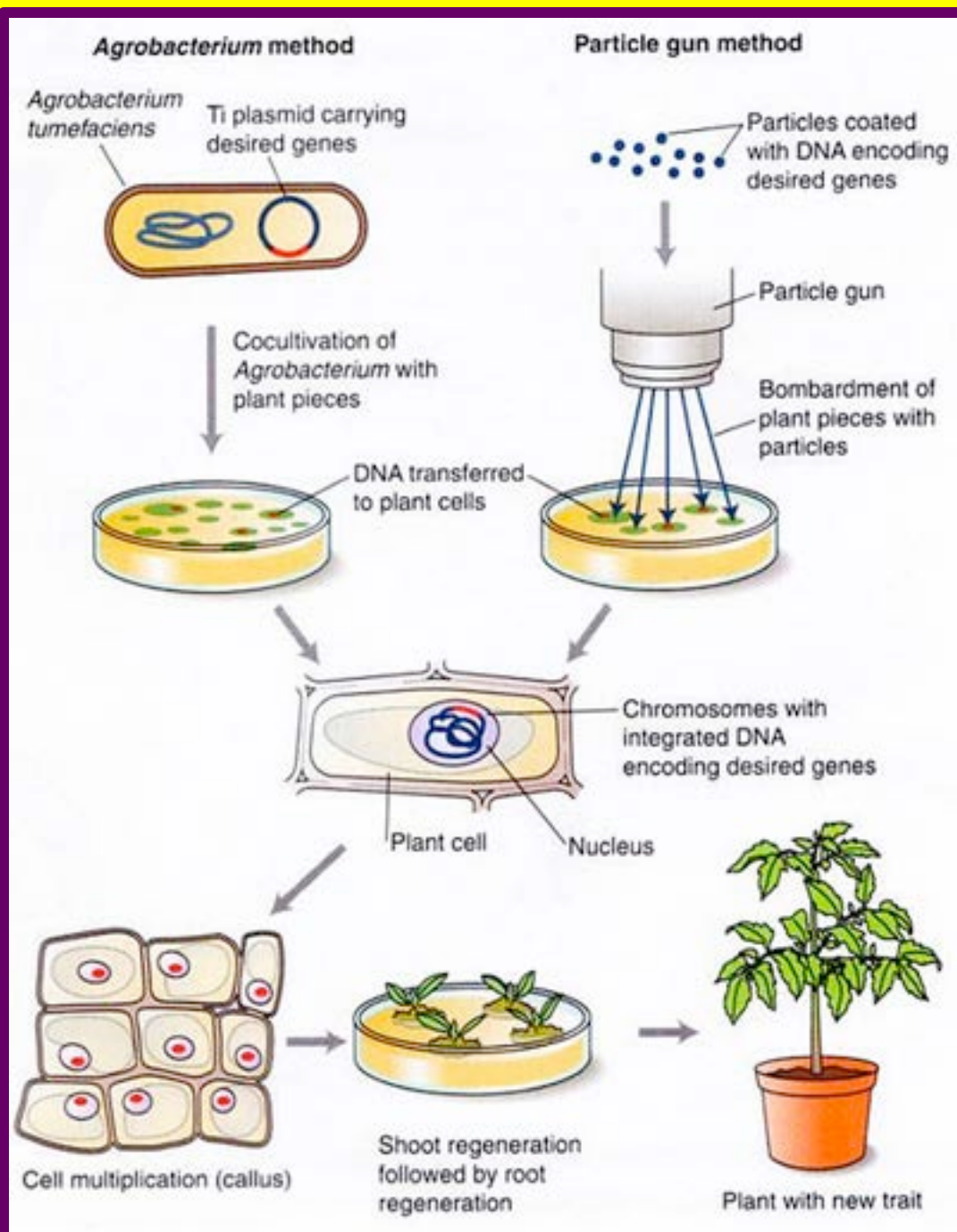
# Marker-Assisted Breeding

**Marker-Assisted Breeding uses our recent ability to map the genome and do conventional breeding with much more precision. In conventional breeding we can only see the traits that are visible to the eye. In marker-assisted breeding we can see the genes themselves.**





# Recombinant DNA Biotechnology aka “Genetic Engineering” (GE) aka “Genetic Modification (GM)”



**GM technology involves moving genes that express desirable traits from one species to another. It is a very precise method as compared to conventional breeding and mutational breeding. The Agrobacterium method is entirely organic. Unlike other breeding methods, the GM varieties are tested almost as if they were a new drug.**

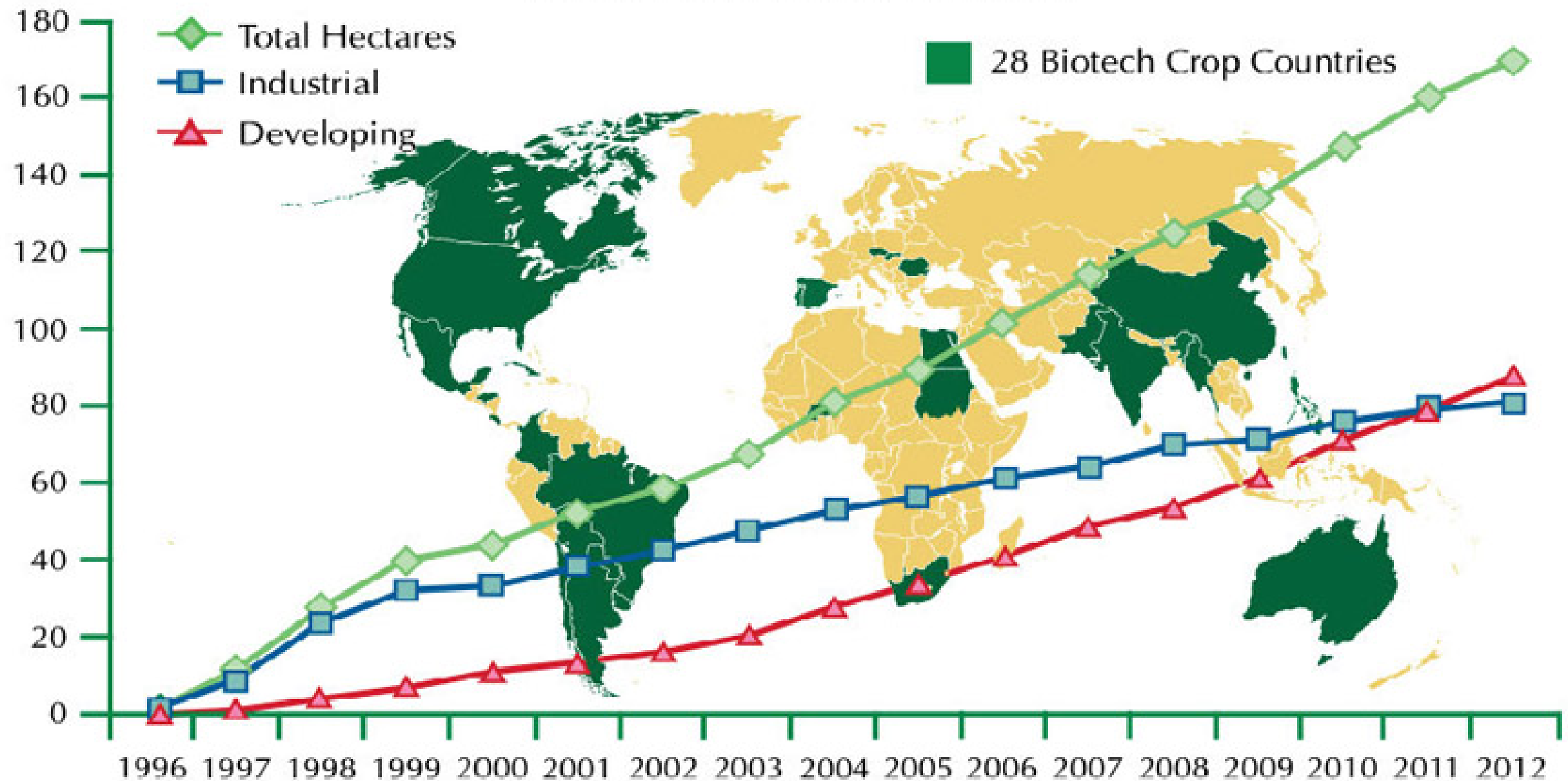


# Organizations That Say GM Food is Safe

**The American Medical Association**  
**The American Assn for the Advancement of Science**  
**The World Health Organization**  
**The National Academy of Sciences**  
**The Royal Society of Medicine (UK)**  
**The European Commission**  
**The American Council on Science and Health**  
**The Academy of Nutrition and Dietetics**  
**The American Society for Cell Biology**  
**The American Society for Microbiology**  
**The American Society of Plant Sciences**  
**The International Seed Foundation**  
**The International Society of African Scientists**  
**The Federation of Animal Science Societies**  
**The Society of Toxicology**  
**The French Academy of Science**  
**The Union of German Academies**  
**The International Council for Science** and many more




## GLOBAL AREA OF BIOTECH CROPS Million Hectares (1996-2012)



*A record 17.3 million farmers, in 28 countries, planted 170.3 million hectares (420 million acres) in 2012, a sustained increase of 6% or 10.3 million hectares (25 million acres) over 2011.*

Source: Clive James, 2012.

**The Main Biotech Crops Grown Today are Corn, Soybeans, Cotton, Canola, and Papaya. Many others are in development.**



**Since 2002, when GM corn was introduced in the Philippines, farmers income has increased by \$155 million per year, and pesticide use has declined more than 50%.**



**A farmer with Bt corn in the Philippines – Greenpeace warned of “dying children and cancer clusters”.**



# Indian farmers forced the government to legalize Bt cotton

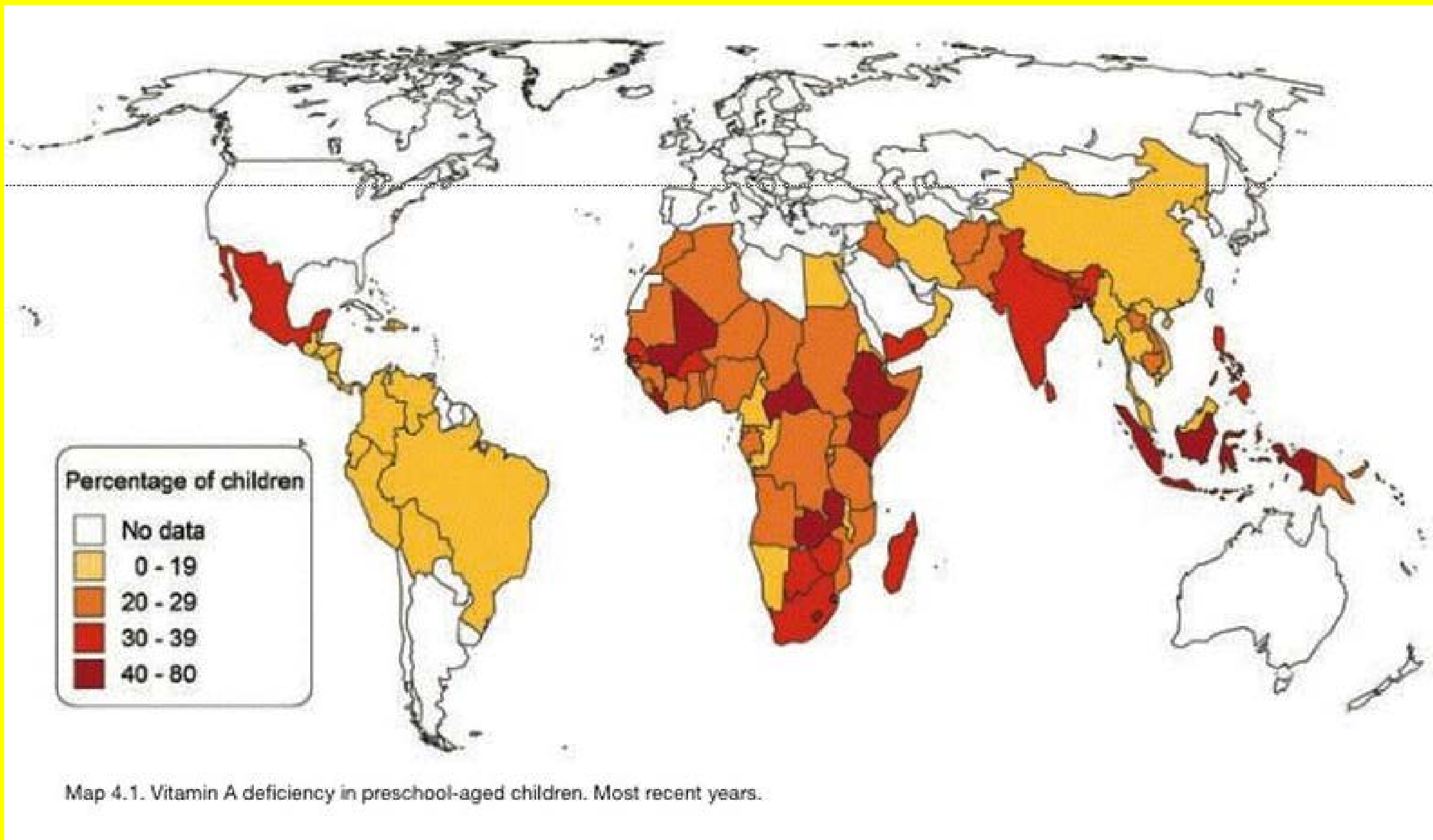
**Since 2002 when GM cotton was introduced in India, production has more than doubled. India was a cotton-importing country. Today India exports 20% of its production. 70 million people are employed in cotton farming.**



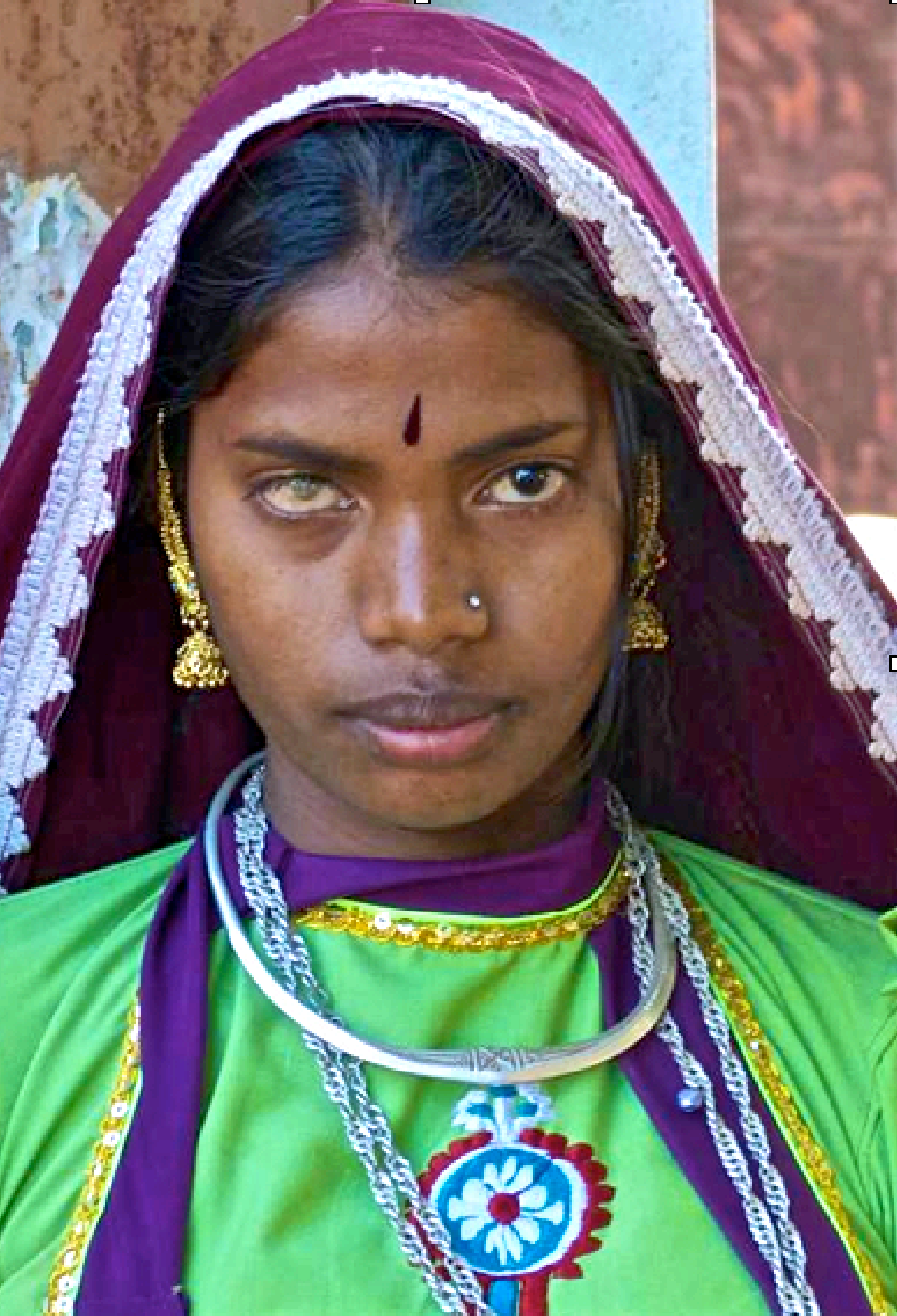




**A good illustration of the effectiveness of GM technology. The potato plants on the right have been modified to resist the Colorado potato beetle. Those on the left have not been modified. It is easy to see why farmers plant GM seeds.**



## Vitamin A Deficiency in Preschool-Age Children



**250 million preschool children are vitamin A deficient.**

World Health Organization

**More than 2 million people die from diseases related to vitamin A deficiency every year.**


Golden Rice Project

*Photo taken in India: December 2012 by Prof Ingo Potrykus*



**Right to left: Prof. Peter Beyer, Dr. Ingo Potrykus, the co-Inventors of Golden Rice. Dr. and Ms. Datta helped in the lab during the nine years of discovery. Their work may one day end nutrient deficiency for hundreds of millions of people.**





**Golden Rice has the potential to eliminate Vitamin A deficiency in developing countries, saving 250,000 - 500,000 children from blindness and death every year due to vitamin A deficiency.**





**The only difference between conventional rice and Golden Rice is that Golden Rice contains the essential nutrient beta carotene.**

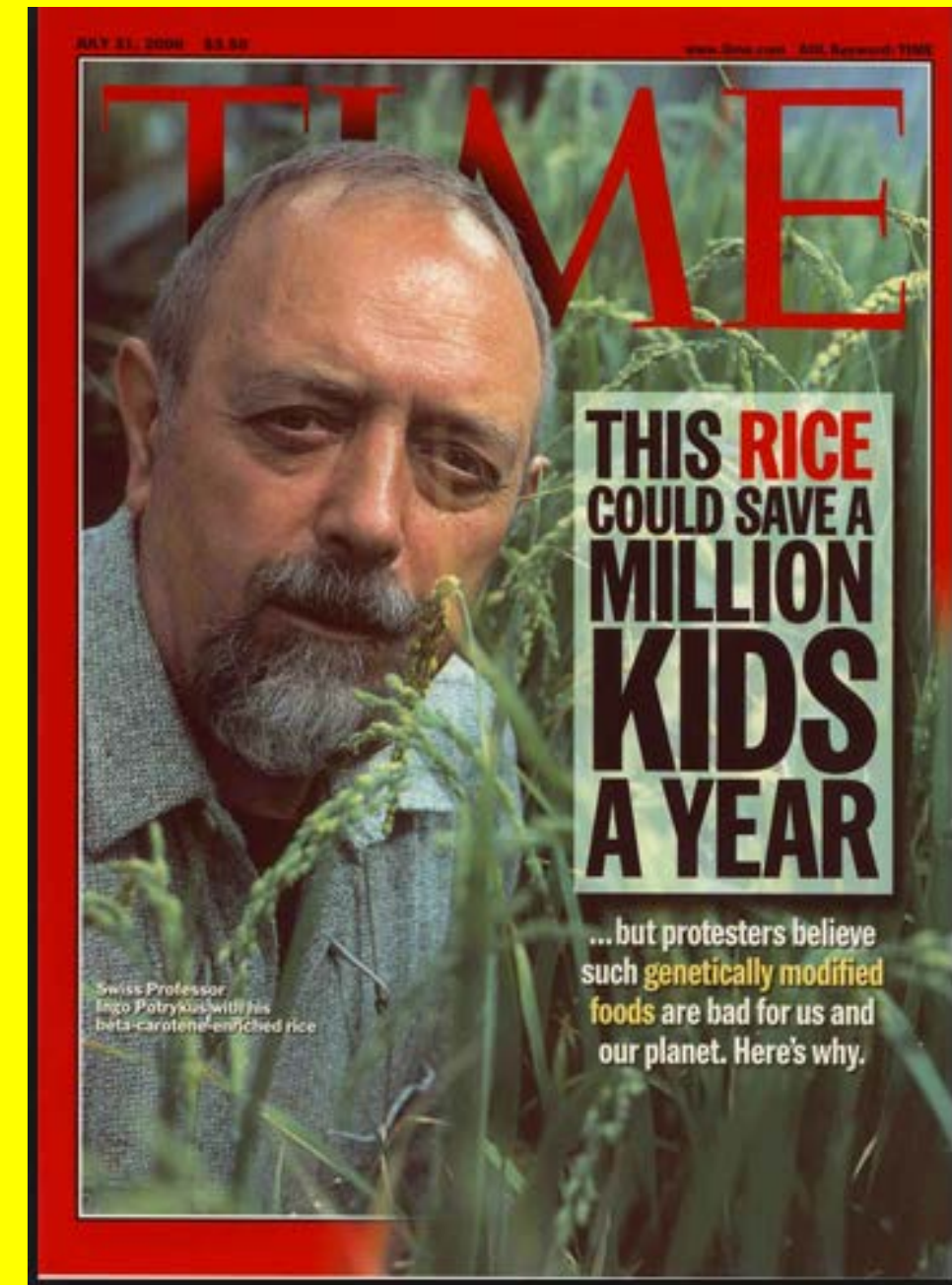




**Under the agreement reached among patent holders and the Golden Rice Project, any farmer in a developing country earning less than \$10,000 a year will not pay a license fee for Golden Rice and will be able to save and replant the seed.**

## Organizations Involved With the Development of Golden Rice

**The Golden Rice Humanitarian Board**  
**The International Rice Research Institute**  
**The Rockefeller Foundation**  
**Syngenta Foundation**  
**Bill and Melinda Gates Foundation**  
**Philippine Rice Research institute**  
**Bangladesh Rice Research Institute**  
**Helen Keller International**  
**Biosafety Resources Network**  
**Biotechnology Institute of the Philippines**  
**Seed Stories**  
**United States Agency for International Development (USAID)**  
**US National Institutes of Health**







## **A Golden Rice Field Trial at the Philippine Rice Research Institute**





**Urban activists, supported by Greenpeace (these are not farmers) destroying research crops in the Philippines in August 2013. Filipino farmers don't have tattoos, video cameras, or dyed hair.**



**Greenpeace anti-GMO Activists Claiming that Golden Rice is Deadly**  
**The ultimate disinformation and ignorance**

## b-Carotene in Golden Rice is as good as b-carotene in oil at providing vitamin A to children<sup>1-4</sup>

Guangwen Tang, Yuming Hu, Shi-an Yin, Yin Wang, Gerard E Dallal, Michael A Grusak, and Robert M Russell

**Greenpeace claims that there has not been enough testing on GM foods, including Golden Rice. Yet when scientists conduct field tests and clinical nutrition tests, Greenpeace destroys the field tests and trashes the scientists who do the nutritional tests. Does Greenpeace really believe that “possible unforeseen circumstances” are worse than 500,000 children going blind every year?**



**40 grams of Golden Rice a day is all that is needed  
to prevent blindness and death**





**Greenpeace's Crime Against Humanity**

**8 Million Children Dead**

[AllowGoldenRiceNow.org](http://AllowGoldenRiceNow.org)



**Greenpeace Canada Office, Toronto, October 2, 2013**





**Greenpeace's Crime Against Humanity**

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