

Genetically Engineered Golden Rice: A Silver Bullet that Misses the Target

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Theme: [Biotechnology and GMO](#)

Promoters of genetic modification (GM) in agriculture have long argued that genetically engineered Golden Rice is a practical way to provide poor farmers in remote areas with a subsistence crop capable of adding much-needed vitamin A to local diets. Vitamin A deficiency is a problem in many poor countries in the Global South and leaves millions at high risk for infection, diseases and other maladies, such as blindness.

Some scientists believe that Golden Rice, which has been developed with funding from the Rockefeller Foundation, could help save the lives of around 670,000 children who die each year from Vitamin A deficiency and another 350,000 who go blind.

Meanwhile, critics say there are serious issues with Golden Rice and that alternative approaches to tackling vitamin A deficiency should be implemented. Greenpeace and other environmental groups say the claims being made by the pro-Golden Rice lobby are misleading and are oversimplifying the actual problems in combating vitamin A deficiency.

Many critics regard Golden Rice as an over-hyped Trojan horse that biotechnology corporations and their allies hope will pave the way for the global approval of other more profitable GM crops. The Rockefeller Foundation might be regarded as a 'philanthropic' entity but its [track record](#) indicates it has been very much part of an agenda which facilitates commercial and geopolitical interests to the detriment of indigenous agriculture and local and national economies.

Smears and baseless attacks

As Britain's Environment Secretary in 2013, [Owen Paterson claimed](#) that opponents of GM were "casting a dark shadow over attempts to feed the world". He called for the rapid roll-out of vitamin A-enhanced rice to help prevent the cause of up to a third of the world's child deaths:

"It's just disgusting that little children are allowed to go blind and die because of a hang-up by a small number of people about this technology. I feel really strongly about it. I think what they do is absolutely wicked."

Just recently, Robin McKie, science writer for The Observer, [wrote a piece](#) on Golden Rice that uncritically presented all the usual industry talking points. On Twitter, The Observer's Nick Cohen chimed in with his support by tweeting:

"There is no greater example of ignorant Western privilege causing needless misery than the campaign against genetically modified golden rice."

Yes, that Nick Cohen; the one who [cheer-led](#) for the illegal invasion of Iraq and who [remains unrepentant](#).

Whether it comes from the likes of corporate lobbyist Patrick Moore, Owen Paterson, biotech [spin-merchant Mark Lynas](#), well-remunerated journalists or from the [lobbyist CS Prakash](#) who engages more in spin than fact, the rhetoric [takes the well-worn cynically devised PR line](#) that anti-GM activists and environmentalists are little more than privileged, affluent people residing in rich countries and are denying the poor the supposed benefits of GM crops.

Golden Rice does not work and opponents are not to blame

Despite the smears and emotional blackmail employed by supporters of Golden Rice, in a 2016 article in the journal [Agriculture & Human Values](#) Glenn Stone and Dominic Glover found little evidence that anti-GM activists are to blame for Golden Rice's unfulfilled promises. Golden rice was still years away from field introduction and may fall far short of lofty health benefits claimed by its supporters.

Professor Glenn Stone from Washington University in St. Louis [stated that](#):

"Golden Rice is still not ready for the market, but we find little support for the common claim that environmental activists are responsible for stalling its introduction. GMO opponents have not been the problem."

Stone added that the rice simply has not been successful in test plots of the rice breeding institutes in the Philippines, where the leading research is being done. While activists did destroy one Golden Rice test plot in a 2013 protest, it is unlikely that this action had any significant impact on the approval of Golden Rice.

Stone said:

"Destroying test plots is a dubious way to express opposition, but this was only one small plot out of many plots in multiple locations over many years. Moreover, they have been calling Golden Rice critics 'murderers' for over a decade."

Believing that Golden Rice was originally a promising idea backed by good intentions, Stone argued:

"But if we are actually interested in the welfare of poor children – instead of just fighting over GMOs – then we have to make unbiased assessments of possible solutions. The simple fact is that after 24 years of research and breeding, Golden Rice is still years away from being ready for release."

Researchers continue to have problems developing beta carotene-enriched strains that yield as well as non-GM strains already being grown by farmers. Stone and Glover point out that it is still unknown if the beta carotene in Golden Rice can even be converted to vitamin A in the bodies of badly undernourished children. There also has been little research on how well the beta carotene in Golden Rice will hold up when stored for long periods between harvest

seasons or when cooked using traditional methods common in remote rural locations.

Claire Robinson, an editor at GMWatch, [has argued](#) that the

rapid degradation of beta-carotene in the rice during storage and cooking means it's not a solution to vitamin A deficiency in the developing world. There are also various other problems, including absorption in the gut, the low and varying levels of beta-carotene that may be delivered by Golden Rice in the first place and the rapid degradation of beta-carotene when stored.

In the meantime, Glenn Stones says that, as the development of Golden Rice creeps along, the Philippines has managed to slash the incidence of Vitamin A deficiency by non-GM methods.

In whose interest?

The evidence presented here might lead us to question why supporters of Golden Rice continue to smear critics and engage in abuse and emotional blackmail when they are not to blame for the failure of Golden Rice to reach the commercial market. Whose interests are they really serving in pushing so hard for this technology?

In 2011, Marcia Ishii-Eiteman, a senior scientist with a background in insect ecology and pest management [asked a similar question](#):

"Who oversees this ambitious project, which its advocates claim will end the suffering of millions?"

She answered her question by stating:

"An elite, so-called "[Humanitarian Board](#)" where Syngenta sits – along with the inventors of Golden Rice, Rockefeller Foundation, USAID and public relations and marketing experts, among a handful of others. Not a single farmer, indigenous person or even an ecologist, or sociologist to assess the huge political, social, and ecological implications of this massive experiment. And the leader of IRRI's Golden Rice project is none other than [Gerald Barry](#), previously [Director of Research](#) at Monsanto."

[Sarojeni V. Rengam](#), executive director of Pesticide Action Network Asia and the Pacific, has called on the donors and scientists involved to wake up and do the right thing:

"Golden Rice is really a 'Trojan horse'; a public relations stunt pulled by the agri-business corporations to garner acceptance of GE crops and food. The whole idea of GE seeds is to make money... we want to send out a strong message to all those supporting the promotion of Golden Rice, especially donor organizations, that their money and efforts would be better spent on restoring natural and agricultural biodiversity rather than destroying it by promoting monoculture plantations and genetically engineered (GE) food crops."

And she makes a valid point. To tackle disease, malnutrition and poverty, you have to first understand the underlying causes – or indeed *want* to understand them. [Walden Bello](#)

[notes](#) that the complex of policies that pushed the Philippines into an economic quagmire over the past 30 years is due to 'structural adjustment', involving prioritizing debt repayment, conservative macroeconomic management, huge cutbacks in government spending, trade and financial liberalization, privatization and deregulation, the restructuring of agriculture and export-oriented production.

And that restructuring of the agrarian economy is something touched on by Claire Robinson who notes that leafy green vegetables used to be grown in backyards as well as in rice (paddy) fields on the banks between the flooded ditches in which the rice grew. She argues that the ditches also contained fish, which ate pests. People thus had access to rice, green leafy veg, and fish – a balanced diet that gave them a healthy mix of nutrients, including plenty of beta-carotene.

But indigenous crops and farming systems have been replaced by monocultures dependent on chemical inputs. Robinson says that green leafy veg were killed off with pesticides, artificial fertilizers were introduced and the fish could not live in the resulting chemically contaminated water. Moreover, decreased access to land meant that many people no longer had backyards containing leafy green veg. People only had access to an impoverished diet of rice alone, laying the foundation for the supposed Golden Rice 'solution'.

Whether it concerns The Philippines, [Ethiopia](#), [Somalia](#) or [Africa](#) as a whole, the effects of IMF/World Bank 'structural adjustments' have devastated agrarian economies and made them dependent on Western agribusiness, manipulated markets and unfair trade rules. And GM is now offered as the 'solution' for tackling poverty-related diseases. The very corporations which gained from restructuring agrarian economies now want to profit from the havoc caused.

Genuine solutions

In finishing, let us turn to what the Soil Association [argued](#) in 2013: the poor are suffering from broader malnourishment than just vitamin A deficiency; the best solution to vitamin A deficiency is to use supplementation and fortification as emergency sticking-plasters and then for implementing measures which tackle the broader issues of poverty and malnutrition.

Tackling the wider issues includes providing farmers with a range of seeds, tools and skills necessary for growing more diverse crops to target broader issues of malnutrition. Part of this entails breeding crops high in nutrients; for instance, the creation of sweet potatoes that grow in tropical conditions, cross-bred with vitamin A rich orange sweet potatoes, which grow in the USA. There are successful campaigns providing these potatoes, a staggering five times higher in vitamin A than Golden Rice, to farmers in Uganda and Mozambique.

The Soil Association says, despite the fanfare, Golden Rice has not yet actually helped a single person and if commercialised it will not be helping to reduce people's reliance on a rice based diet. It believes that we could have gone further in curing blindness in developing countries years ago if only the money, research, and publicity that have gone into Golden Rice over the last 15 years had gone into proven ways of curing the Vitamin A deficiency that causes blindness.

However, instead of pursuing genuine solutions, we continue to get smears and [pro-GM spin](#) in an attempt to close down debate.

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