THE GOLDEN RICE HOAX[1]

Vandana Shiva

First conceived in the 1980s and a focus of research since 1992, genetically engineered vitamin A rice has been heralded on the cover of Time magazine in 2000 as a genetically modified (GMO) crop with the potential to save millions of lives in the Third World, proclaimed as a miracle cure for blindness[2]."

According to the UN, more than two million children are at risk due to vitamin A deficiency, which can cause vision impairment and lead to blindness. Is this golden rice really a miracle cure and the only means for preventing blindness in Asia? Or will it instead introduce new ecological problems just as the Green Revolution did, threaten biodiversity across Asia (Centre of Origin for rice crops)?

Despite unlimited resources at political, institutional, financial and corporate level, no reliable and stable vitamin A rice, that can significantly relieve the symptoms of Vitamin A deficiency in hungry people, has been produced in over 20 years of research[3].

In 2018, according to an article by Allison Wilson, PhD and Jonathan Latham, PhD[4], *"the US Food and Drug Administration (FDA) has concluded its consultation process on Golden Rice by informing its current developers, the International Rice Research Institute (IRRI), that Golden Rice does not meet the nutritional requirements to make a health claim. [...] In an attached memo[5], FDA notes the beta-carotene content of unmilled Golden Rice GR2E ranged from 0.50-*

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[1] *Extracts from:*
- *Genetically Engineered Vitamin A Rice: A Blind Approach to Blindness Prevention,* by Dr.Vandana Shiva, Research Foundation for Science, Technology, and Ecology (2000), http://www.greens.org/s-r/23/23-18.html
- *THE "GOLDEN RICE" HOAX – When Public Relations replaces Science,* by Dr.Vandana Shiva, Research Foundation for Science, Technology, and Ecology (2000), http://online.sfsu.edu/repstein/GEessays/goldenricehoax.html
- *Biodiversity Or Gmos: Will the Future of Nutrition be in Women's Hands or Under Corporate Control?,* Navdanya, March 2015, https://seedfreedom.info/campaign/biodiversity-or-gmos/

[2] Everding, Gerry. "Genetically Modified Golden Rice Falls Short on Lifesaving Promises | ." *The Source | Washington University in St. Louis*, June 2, 2016. https://source.wustl.edu/2016/06/genetically-modified-golden-rice-falls-short-lifesaving-promises/

[3] Hilbeck, Angelika, and Hans Herren. "Millions Spent and No Vitamin A Deficiency Relieved." *Independent Science News | Food, Health and Agriculture Bioscience News*, August 10, 2016. https://www.independentsciencenews.org/health/millions-spent-who-is-to-blame-failure-gmo-golden-rice/

[4] Wilson, Allison, and Jonathan Latham. "GMO Golden Rice Offers No Nutritional Benefits Says FDA." *Independent Science News | Food, Health and Agriculture Bioscience News*, June 3, 2018. https://www.independentsciencenews.org/news/gmo-golden-rice-offers-no-nutritional-benefits-says-fda/

[5] U.S. Food & Drug Administration. Biotechnology Notification File No. 000158 | Note to the File. May 8, 2018. https://www.fda.gov/downloads/Food/IngredientsPackagingLabeling/GEPlants/Submissions/ucm607450.pdf

2.35ug/g (FDA 2018a). That is, beta-carotene levels in Golden Rice are both low and variable. This compares to beta-carotene levels measured in non-GMO foods such as fresh carrot (13.8-49.3ug/g[6]); Asian greens (19.74-66.04 ug/g[7]); and spinach (111ug/g). FDA notes the mean value of beta-carotene for GR2E is 1.26ug/g. This is, paradoxically, less beta-carotene than the 1.6ug/g measured for the original iteration of Golden Rice (Ye et al. 2000)."

Moreover, when we consider the number of patents involved in this initiative, it becomes all too clear that the only beneficiaries of these supposedly 'people-led' ventures are large companies operating for profit – not for people[8].

In 2011, the Bill & Melinda Gates Foundation resurrected this failed idea, by donating some US$10.3 million dollars to IRRI (which BMGF heavily funds as part of the CGIAR system) for the development of Golden Rice[9]. When peasants started a Movement to Stop Golden Rice, Bill Gates gave free rein to the Gates funded Cornell Alliance for Science biased journalist Mark Lynas to distort the reporting in favor of golden rice. Through Lynas and the Gates PR for Golden Rice, misleading reports were spread, instead of what independent scientists and peasants actually had to say[10].

Subsequently, in 2016, the Biotech PR lobby organised "Nobel Laureates" to promote Golden Rice and attack any criticism[11] from Civil Society Movements[12].

Despite strong opposition, a Golden Rice permit for 'Direct Use for Food, Feed and Processing' was issued by the Philippines' Dept. of Agriculture's Bureau of Plant Industry (DA-BPI) in December 2019. The Filipino Stop Golden Rice network immediately started a campaign[13], and on August 7th, 2020, which is now celebrated as "No to Golden Rice Day", they released their statement "Why we oppose Golden Rice"[14].

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[6] Schaub P, Wüst F, Koschmieder J, et al. Nonenzymatic β-Carotene Degradation in Provitamin A-Biofortified Crop Plants. *J Agric Food Chem*. 2017;65(31):6588-6598. doi:10.1021/acs.jafc.7b01693, https://pubmed.ncbi.nlm.nih.gov/28703588/

[7] Chandra-Hioe MV, Rahman HH, Arcot J. 2017. Lutein and β-Carotene in Selected Asian Leafy Vegetables. J Food Chem Nanotechol3(3): 93-97. http://unitedscientificgroup.com/journals/ets/articles/v1n1/jfcn-043-maria-chandra-hioe.pdf

[8] GRAIN, MASIPAG and Stop Golden Rice! Network. "Don't Get Fooled Again! Unmasking Two Decades of Lies about Golden Rice." *Grain*, November 21, 2018. https://www.grain.org/en/article/6067-don-t-get-fooled-again-unmasking-two-decades-of-lies-about-golden-rice

[9] Masipag National Office. "Farmer-Scientist Group Deplore Secretive Visit of Bill Gates to IRRI, Golden Rice Commercialization Possible Agenda." *Masipag.Org*, April 14, 2015. https://masipag.org/2015/04/farmer-scientist-group-deplore-secretive-visit-of-bill-gates-to-irri-golden-rice-commercialization-possible-agenda/

[10] Masipag. "Philippines: Corporate science subdues the poor." *Grain*, July 8, 2016. https://www.grain.org/fr/article/entries/5509-philippines-corporate-science-subdues-the-poor

[11] Robinson, Claire. "Pro-GMO Campaign Exploits Nobel Laureates in 'Golden Rice' Greenpeace Attack," July 4, 2016. https://theecologist.org/2016/jul/04/pro-gmo-campaign-exploits-nobel-laureates-golden-rice-greenpeace-attack

[12] Chow, Lorraine. "Greenpeace to Nobel Laureates: It's Not Our Fault Golden Rice Has 'Failed as a Solution.'" *EcoWatch*, June 30, 2016. https://www.ecowatch.com/greenpeace-to-nobel-laureates-its-not-our-fault-golden-rice-has-failed-1896697050.html

[13] Masipag National Office. "Farmer-Scientist Group Condemns Golden Rice Approval." *Masipag.Org*, December 19, 2019. https://masipag.org/2019/12/farmer-scientist-group-condemns-golden-rice-approval/

[14] Stop Golden Rice Network (SGRN). "Why We Oppose Golden Rice." *Independent Science News | Food, Health and Agriculture Bioscience News*, August 7, 2020. https://www.independentsciencenews.org/health/why-we-oppose-golden-rice/

In 2000[15], Navdanya had also started a campaign in India showing that there were superior and safer alternatives to genetically engineering vitamin A into rice[16].

We read in goldenrice.org, that children under the age of 7 require 450 'units' of Retinol (Vitamin A) Equivalents. This means children would therefore have to eat 300gms of Golden Rice to get their daily requirement of vitamin A. In indigenous food cultures, a child's diet normally contains less than 150 gms of rice, but also contains a range of other nutritious foods grown by rural communities. In fact, Golden Rice is 350% less efficient in providing vitamin A than the biodiversity alternatives that nature has to offer.

Table 1: Traditional Indian food Sources of Vitamin-A and their β-carotene content:

Source	**Hindi Name**	**Content (microgram/100mg)**
Amaranth leaves	Chaulai Saag	266- 1166
Coriander leaves	Dhania	1166- 1333
Curry leaves	Curry patta	1333
Drumstick leaves	Saian Patta	1283
Cabbage	Bandh Gobhi	217
Fenugreek leaves	Methi- ka-saag	450
Radish leaves	Mooli-ka-saag	750
Mint	Pudina saag	300
Spinach	Palak saag	600
Carrot	Gajar	217- 434
Pumpkin (yellow)	Kaddu	100- 120
Mango (ripe)	Aam	500
Jackfruit	Kathal	54
orange	Santra	35
Tomato (ripe)	Tamatar	32
Milk (cow, buffalo)	Doodh	50-60
Butter	Makkhan	720- 1200
Egg (hen)	Anda	300- 400
Liver (goat, sheep)	Kaleji	6600- 100000
Cod liver oil		10,000- 100,000

Source: Nutritive value of Indian foods

[15] Ibid.
[16] Shiva, V., Singh, U., & Navdanya (Organization). (2002). *Vitamin—A Deficiency: Green Solutions Vs Golden Rice*. Diverse Women for Diversity. https://books.google.it/books?id=4gruNAAACAAJ

The Golden Rice HOAX

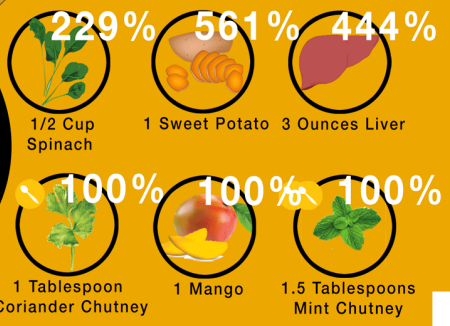
Profits from patents, not nutrition for children

1 What is Golden Rice?

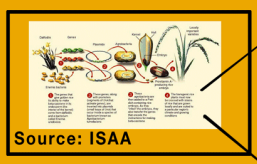
Golden Rice is a genetically engineered **rice** with genes from **daffodils** and **bacteria** to produce 1.6 milligrams of Vit A in a kilogram of rice.

2 It will not alleviate Vitamin A Deficiency

Traditional Foods with Vitamin-A: Daily Value (%)



An adult will need to eat **2.272 kilograms** of golden rice everyday to receive adequate Vitamin-A.



Source: ISAA

The transgenic rice plants must now be crossed with strains of rice that are grown locally and are suited to a particular region's climate and growing conditions. -ISAA.org

3 Trojan Horse

If approvals are given under a humanitarian **guise**, Syngenta can ***commercialise*** when they please. With the trait being crossed into local varieties of Rice, Syngenta can claim **ownership** over all those varieties in the future, for **their nutrition**, **climate resilience and their yield**. The yield of Golden Rice ***does not*** come from the 'Golden' trait. It comes from the plant the trait is put into.Engineering the Vitamin A trait into Rice is merely a means to establish **Intellectual Property Rights.**

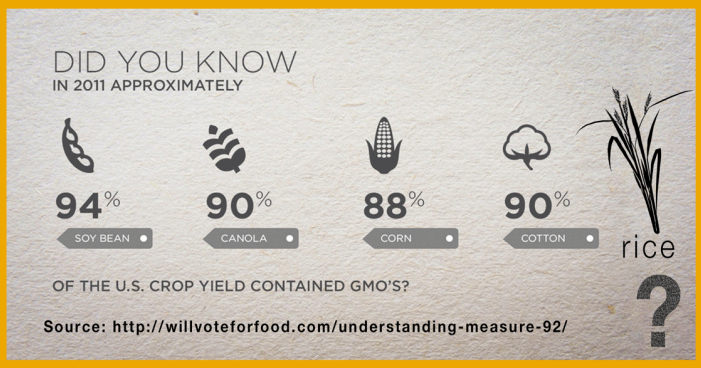
4 Golden Rice is not a Humanitarian Project

Syngenta owns **commercial rights** to GoldenRice and has negotiated licences with other Corporations

Source: http://www.goldenrice.org/Content1-Who/who4_IP.php

5 Charity Cartel

The fraudulent philanthropy is a means to gain access and dodge anti-trust regulators Rice eating cultures of the Global South must protect their food security and not allow a corporate takeover of the very basis of their survival.



SAY NO TO GOLDEN RICE

Will Gates destroy India's rich food cultures and Ayurvedic knowledge with GMOs and Fake Food?

Not only do these indigenous alternatives based on farmers' knowledge provide more vitamin A than Golden Rice at a lower cost, they also provide other nutrients.

Indeed, the first deficiency of genetic engineering rice to produce vitamin A is the eclipsing of alternative sources of vitamin A.

The lower-cost, accessible and safer alternative to genetically engineered rice is to increase biodiversity in agriculture. Further, since those who suffer from vitamin A deficiency suffer from malnutrition generally, increasing the diversity of crops and diversity of diets of poor people who suffer the highest rates of deficiency is the reliable means for overcoming nutritional deficiencies.

Even the World Bank has admitted that rediscovering the use of local plants and conservation of vitamin A rich green leafy vegetables and fruits have dramatically reduced vitamin A deficiency. Women in Bengal use more than 200 varieties of field greens.

Over 3 million people have benefited greatly from a food-based way of removing vitamin A deficiency by increasing vitamin A availability through home gardens. The higher the diversity crops the better the uptake of pro-vitamin A.

Environmental costs of Vitamin A rice

Tragically, sources of vitamin A in the form of green leafy vegetables are being destroyed by the Green Revolution and genetic engineering, which promote the use of herbicides in agriculture. For example, bathua, a very popular leafy vegetable in North India has been pushed to extinction in Green Revolution areas where intensive herbicide use is a part of the chemical package.

Vitamin A from native greens and fruits is produced without irrigation and wastage of scarce water resources. Introducing vitamin, A in rice implies a shift to a water-intensive system of production since so-called 'high yielding' rice varieties are highly water-demanding. Vitamin A rice will therefore lead to mining of ground water or intensive irrigation from large dams with all the associated environmental problems of waterlogging and salinisation.