Ingo Potrykus

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Ingo Potrykus is the developer of 'Golden Rice' - a new yellow-tinted rice variety genetically engineered to contain beta-carotene, a vitamin-A precursor.

Golden Rice has been promoted as a miracle crop, and Ingo Potrykus portrayed as a scientific hero, but there are many who question its real value and the role played by Potrykus in promoting it.

Potrykus was born in Germany in 1933. He helped develop plant genetic engineering at the Friedrich Miescher-Institute, Basel, where he worked from the mid-1970s. He went on to become Professor of Plant Sciences at the Swiss Federal Institute of Technology, Zurich, from 1987 to April 1999, when he retired.

Prior to his retirement, his research group focused on genetic engineering projects aimed at improving yield stability and food quality in rice, wheat, sorghum and cassava. His best known project is Golden Rice which, via the insertion of a bacterial gene and two daffodil genes, contains provitamin A.

Golden Rice is intended to address a major problem in developing countries arising from vitamin A deficiency (VAD). The World Health Organisation (WHO) estimates that 230 million children are at risk of VAD. Vitamin A is important for sight, immunity to disease, growth and normal development. VAD is a major cause of blindness, especially among children, and it also exacerbates the effects of measles and diarrhoeal and respiratory illnesses. Over one million VAD-related deaths occur each year. VAD is particularly concentrated in SE Asia, sub-Saharan Africa and Latin America, as well as in refugees'settlements and among displaced populations. VAD also tends to occur where rice is the major staple food as rice plants do not provide provitamin A.

Potrykus originally approached Nestle about funding his Golden Rice project. When that failed, he approached the Rockefeller Foundation who agreed to do so, as did FAIR, the European Commission's agricultural research programme.

Since his retirement, Potrykus has devoted his time and energy to achieving the introduction of Golden Rice. He is president of the international Humanitarian Golden Rice Board and intends to make the rice freely available to 'national and international agricultural research centres'. Collaboration is already underway with 14 rice institutions in India, China, Vietnam, Bangladesh, Indonesia, and the Philippines.

However, Potrykus and his work remain highly controversial for two reasons: its PR exploitation, and the question of whether Golden Rice provides either the most effective or the most desirable solution to VAD.

The controversy over the PR uses of Golden Rice arose in 2000 when, a year after his official retirement, Potrykus decided it was the time to launch a publicity offensive on Golden Rice. He initially submitted a paper to the journal Nature, with a covering letter pointing up its relevance to the wider GM debate, but Nature rejected it. At that point, Peter Raven, a close ally of Monsanto's, became involved and with Raven's help Potrykus managed to launch his publicity bandwagon.

Potrykus says (http://www.mindfully.org/GE/Golden-Rice-Ingo-Potrykus.htm) , 'The press conference in St. Louis, the presentation at the Nature Biotechnology Conference in London, the Science publication with

the commentary (Guerrinot 2000), the feature story in TIME Magazine all led to an overwhelming coverage of the "Golden Rice" story on TV, radio, and in the international press.'

His relationship with the biotech industry is a long-standing one. As a result of his research, he is named as 'inventor' and thus has interest in some thirty plant-related patents, most of them belonging to Syngenta/Novartis. Alert to the value of the PR bonanza arising from Golden Rice, the biotech industry was keen to help Potrykus get round the multiple impediments posed by the intellectual property rights (IPR) the industry posessed. Potrykus records how 'only (a) few days after the cover of "Golden Rice" had appeared on TIME Magazine, I had a phone call from Monsanto offering free licenses for the company's IPR involved. A really amazing quick reaction of the PR department to make best use of this opportunity.'

However, the PR exploitation of Golden Rice triggered a number of awkward questions. The journalist Michael Pollan (http://www.biotech-info.net/yellow_hype.html) , for instance, wrote in The New York Times magazine, 'A spokesman for Syngenta, the company that plans to give golden rice seeds to poor farmers, has said that every month of delay will mean another 50,000 blind children. Yet how many cases of blindness could be averted right now if the industry were to divert its river of advertising dollars to a few of these programs?' (ie existing, but less well publicised, programs for delivering Vitamin A)

Even Gordon Conway of the Rockefeller Foundation was moved to comment (http://www.biotech-info.net/conway_greenpeace.pdf) that 'the public relations uses of Golden Rice have gone too far. The industry's advertisements and the media in general seem to forget that it is a research product that needs considerable further development before it will be available to farmers and consumers.'

Pollan responded (http://www.biotech-info.net/yellow_hype.html) to another Conway comment, 'We do not consider golden rice the solution to the vitamin-A deficiency problem' , with a question: 'So to what, then, is golden rice the solution?' The answer, Pollan said, was plain: 'To the public-relations problem of an industry that has so far offered consumers precious few reasons to buy what it's selling -- and more than a few to avoid it. Appealing to our self- interest won't work, so why not try pricking our conscience?'

Potrykus himself, in responding to the criticisms of Golden Rice voiced by Greenpeace, claimed (http://www.mindfully.org/GE/Ingo-Potrykus-Responds-9feb01.htm) to share their disgust 'about the heavy PR campaign of some agbiotech companies using results from our experiments.' However, when asked in an interview (http://www.fumento.com/goldenrice.html) by a biotech supporter whether he believed the industry had 'overhyped' the value of golden rice he responded very differently, 'I did not follow the advertisements of the industry, but it is difficult to overhype the value of golden rice.'

In reality, it was Potrykus himself who had encouraged the PR use of Golden Rice as a lever for promoting genetic engineering. He has said (http://www.mindfully.org/GE/Golden-Rice-Ingo-Potrykus.htm) that he saw the publicising of Golden Rice as 'a timely and important demonstration of positive achievements of the GMO technology. GMO technology had been used to solve an urgent need and to provide a clear benefit to the consumer, and especially to the poor and disadvantaged. To make the information available to a wider audience for a more balanced GMO discussion, we submitted the manuscript to Nature with a covering letter explaining its importance in the present GMO debate.'

Potrykus saw Golden Rice, then, as a poster-child for GM, which had been struggling to demonstrate any benefits to consumers or the poor. This in turn, he hoped, could help to sway public debate. Potrykus has also proven more than happy to use Golden Rice as a PR weapon with which directly to attack the biotech industry's critics.

He has written (http://www.mindfully.org/GE/Ingo-Potrykus-Responds-9feb01.htm#1) , 'What these radical opponents are doing is "Brunnenvergiftung" (well-poisoning) to the disadvantage of the poor. What I find very disturbing, is the fact, that they can play their dirty game without having to take responsibility for what they are damaging.'

In this spirit he has accused Greenpeace of 'crimes against humanity' and complains bitterly of the biosafety checks imposed as a result of the concerns they and other critics have raised. The consequence he says 'is that many thousands are dying, or have severe health problems such as irreversible blindness, who otherwise could live healthy and productive lives.' ('Swiss scientist scores Greenpeace', The Philippine Star, 1 September 2002)

This is curiously at odds with another Potrykus' admission (http://www.mindfully.org/GE/Ingo-Potrykus-Responds-9feb01.htm) about the criticisms raised by Greenpeace: 'I am happy to acknowledge, that Greenpeace is arguing on a rational basis... I also acknowledge, that Greenpeace has identified a weak point in the strategy of using Golden Rice for reducing vitamin A-deficiency.'

That weak point is the ability of Golden Rice to actually deliver results. The amount of vitamin A precursor it contains falls far short of the normal recommended daily allowance. Some estimates even suggest it would require a child to eat 20-50 bowls of rice a day to get the recommended daily allowance of vitamin A.

Yet Potrykus was already telling the world back in 2000 that 'GMO technology had been used to **solve** an urgent need and to provide a clear benefit'. It was these claims that lay behind the Time headline, 'This rice could save a million kids a year.' But as Gordon Conway of the Rockefeller Foundation has made clear, Golden Rice should never have been touted as 'the solution to the vitamin-A deficiency problem'. It is a research product in need, as Conway says, of 'considerable further development.'

The renowned Indian scientist Dr Pushpa Bhargava is among many who have complained that when they looked at the arithmetic the Golden Rice 'hype' fell apart: 'it was found that only a miniscule fraction of the daily requirement of vitamin A will be taken care of by the amount of rice one normally consumes in our country in one day. When I pointed out this to the inventor of golden rice at a meeting in Chennai on 30th October 2002 organized by National Academy of Agriculture, I was told that the daily requirement of vitamin A prescribed by WHO was unrealistic-that is, far too high! Should WHO standards set up after stringent analysis cease to be a benchmark when they are inconvenient? Besides, for meeting even the prescribed WHO requirement of vitamin A, there are other cheaper and better sources already available.' (Indian biotechnology needs truth, not hype (http://www.biospectrumindia.com/content/columns/103102001.asp))

Potrykus has always claimed that his research focuses on problems which cannot be solved by traditional methods but this, in fact, ignores known low-risk solutions such as encouraging farmers to go back to growing indigenous vitamin A-rich plants among main crops, a practice wiped out by 'Green Revolution' herbicide-intensive farming methods. In their place Potrykus offers a massively expensive project, in terms of both devlopment, testing and distribution, involving all the uncertainties of genetic engineering.

Hans Herren is another critic of Golden Rice. Herren's work on natural biological control helped save the endangered cassava crop in large areas of Africa (from Senegal to Mozambique), removing a threat to the food security of some 300 million people. A World Food Prize winner, Herren has commented, 'We already know today that most of the problems that are to be addressed via Golden Rice and other GMOs can be resolved in matter of days, with the right political will.'

Vitamin A deficiency, like almost all hunger and malnutrition, thrives where there is poverty, poor food distribution, lack of land and resources to grow food, and a lack of political will to address these issues. And if the will and resources are suddenly available to overcome these difficulties in the case of Golden Rice, why are they not available in the case of cheaper alternative sources of vitamin A already available?

The Golden Rice project makes no sense except in a context of Public Relations.

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