

Syngenta's Rice Monopolies

How the Syngenta company tries to lay claim to the most important parts of the genome of most plant species all over the world so as to gain control over global food production.

Syngenta is known for its engagement in the so-called "Golden Rice" project. This project, which has now been running for five years, is supposed to help the poor in the countries of the South overcome malnutrition, especially Vitamin A deficiency. Syngenta claims that it has no commercial interest in the project. But recent research by Greenpeace shows the contrary. Not only was a patent application for genetically engineered Golden Rice filed by Syngenta very recently, far reaching patent applications on major parts of the rice genome and other important crop plants have been filed worldwide. It looks as if Syngenta is trying to take over control over key elements of plant breeding all over the world.

Patent on Golden Rice for "humanitarian" reasons?

Recent publications of research by Syngenta on a new generation of genetically engineered "Golden Rice" were accompanied by statements emphasising the humanitarian nature of the whole project. "Syngenta has no commercial interest in Golden Rice. ... Golden Rice 2 transgenic events will be donated for further research and development through license under certain conditions."¹

Careful reading of this statement reveals a pretty ambiguous strategy and even clear contradictions in the company's messages. At the same time as pretending that there are no commercial interests, the company explains that the technology behind Golden Rice will only be "donated" upon licence. The announcement could be seen as a signal that there are in fact monopoly claims on the

technology behind Golden Rice. Indeed, recent research by Greenpeace shows that Syngenta already applied for a worldwide patent on these genetically engineered plants. WO 04/085656 was filed in March 2004. By using the full opportunities offered by the international Patent Cooperation Treaty (PCT)², the patent was applied for not only in Europe and North America, but in more than 100 countries including India, China, the Philippines, Vietnam and 16 African countries. Why is the company trying to claim global patent monopoly rights on this technology (and all derived plants and seeds) if it has no commercial interests?? Even if the company will give free access to some researchers under certain conditions, it is absolutely clear that a patent remains nothing else but an instrument for protecting commercial interests.

Before the new publication on Golden Rice already, Syngenta claimed that Golden Rice will be given for free to small farmers in developing countries. But the first generation of Golden Rice was also covered by a patent application by Syngenta, this reserving the option for the company to still charge farmers and breeders.³

Ironically, the case of Golden Rice itself shows how rice plants in particular have been caught up in patent claims. When the Swiss researcher, Potrykus, started working on the development of Golden Rice, he found that he had already to deal with up to 70 patents held by 32 different owners.⁴

From these various facts, too, it seems fairly evident that the whole Golden Rice project is driven by economic interests and – as the examples below show - by a desire to extend corporate control over as many levels of seed and food production as possible.

Syngenta is the largest producer of pesticides in the world and already the third biggest seed

² www.wipo.int/pct/en

³ WO 00/ 53768

¹ Paine, J.A., Shipton, C.A., Chaggar, S., Howells, R.M., Kennedy, M.J., Vernon, G., Wright, S.Y., Hinchliffe, E., Adams, J.L., Silverstone, A.L. and Drake, R., 2005. Improving the nutritional value of Golden Rice through increased pro-vitamin A content. *Nature Biotechnology*, 23, 482-487.

⁴ Kryder, R., Kowalski, S. & Krattinger, A., 2000. The Intellectual and Technical Property Components of Pro-Vitamin A Rice (Golden Rice): A Preliminary Freedom-to-Operate Review", ISAAA Briefs No.20, International Service for the Acquisition of Agro-biotech Application, New York

company, with sales of \$ (US) 7.1 billion in 2004 and pre-tax profits of \$ 466 million.⁵ In Europe Syngenta already holds at least 65 patents related to seeds and plant breeding, and a further 250 have been applied for.⁶

Syngenta's mega-genome monopoly claims

According to a UK study in 2003,⁷ Syngenta is responsible for severe restrictions to access to the rice genome. Syngenta, which analysed large parts of the rice genome with help of the US company Myriad⁸, has only allowed access to this information under certain conditions. Thus the data have only been available on Syngenta's home page, and not on public databases. Under certain conditions, researchers are granted access to the database, and scientists performing commercial research have had to negotiate special rights of access. Sir John Sulston, Nobel prize winner for medicine and co-founder of the Human Genome Project, criticised this practice of Syngenta's. In his opinion, the information should be compiled in large databases, be freely accessible and allow comparison between different records of data.⁹

Although Syngenta's project sequencing the rice genome was already completed in 2001, the full data were only published in 2004, at the same a research team from China published similar data. It appears that the period of time before the full publication of the data was used by Syngenta to pursue its true commercial interests. The company applied for extremely broad patent monopoly claims on the genome of rice plants, creating a real threat to agricultural research, breeders and farmers globally – and thus to food security worldwide.

⁵ Syngenta 2005. Annual Report 2004. <http://www.syngenta.com>. Syngenta was formed in the year 2000 from a merger of Novartis Agribusiness and Zeneca Agrochemicals.

⁶ Figures: Greenpeace research at European Patent Office, April 2005

⁷ Cornish W.R., Llewelyn, M. and Adcock, M. 2003. Intellectual Property Rights (IPRs) and Genetics. Public Health Genetics Unit, UK. http://www.phgu.org.uk/about_phgu/intellect_prop_rights.html, see also Marshall, E., 2002. A deal for the rice genome. *Science* 296: 34.

⁸ Myriad US is known for being the monopoly holder of several scandalous patents on human breast cancer, BRCA.

⁹ See footnote 7

Syngenta's patent strategy of claiming large parts of the genome is evident from several World Patent applications. These patents were recently filed for more than 100 countries, with North and South America, Europe, and many African and Asian countries included. Again the PCT treaty has been used, as with the patent on Golden Rice (see above).

There is a whole family of these patent applications. Three huge applications cover well over 1,000 listed gene sequences, most of which originated from rice and maize. The basic, simple method for identifying these important gene sequences is to simply compare already existing data banks. Data originating from different plant species and collected by several researchers has been used for this purpose. Another step was to measure the gene activity of the plants (gene expression profiles) under certain conditions (diseases, stress, growing conditions) to find out which of those genes, for the most part already simulated.

In der known, might be of special interest. The technical methods used in this step were also already published and not invented by Syngenta. So the genetic information gathered as being a Syngenta "invention" in these patents was discovered by using relatively simple methods which were not new, while the genetic information itself was of course not invented, it was simply discovered in the plants. There is no real invention attached to these patents, it is simply a trick to obtain a monopoly on plants' genetic resources on a large scale.

All three applications were filed in June 2002.

- WO 03/ 008540 claims gene sequences which are relevant for plants under stress conditions
- WO 03/000905 claims gene sequences with relevance to the nutritional value of grains
- WO 03/000906 claims gene sequences involved in defence mechanisms against plant diseases

In addition to the gene sequences, claims have been made to a lot of genetically engineered plants into which one or several of the gene sequences could be inserted. Several pages in each patent application list the names of plant species to which the patent should apply, covering each and everything from ananas to

zinnia. The most important crops involved are rice, maize corn, wheat and other cereals. But the most dramatic implications of these patents are the result of the claims being made to all uses of the listed gene sequences, no matter if the usage applies in biotechnological or conventional breeding. The mechanism by which the patents acquire this incredible and shocking coverage is basically as follows:

Unrestricted claiming of functions

The gene sequences claimed are described not by a precise technical function, but by a whole range of possible biological purposes (such as natural defence mechanism, growth, or other basic metabolic pathways in the plant). At the same time that the exact functions of the gene sequences remain largely unknown, all related products (protein, peptides) produced by the sequences are claimed as well.

Monopoly on all similar gene sequences

Claims are made not only to the gene sequences as they were isolated and analysed, but to all gene sequences with similar structures and similar functions. Syngenta is making use of the well known fact that the structure of the genome and function of many sequences of many plant species have a lot of similarities. By pointing to a possible function of a gene in the rice or maize plant, all other plants species with similar genes become covered by the patents.

Normal breeding affected

Syngenta claims not only the usage of genes for transformation of plants (and the resulting plants and seeds) but also their uses and functions in their natural context. All three patent applications explicitly mention the use of the genes even for simple screening of conventional plants or their wild relatives, to find out which of them might be most useful for conventional breeding purposes. Relevant research methods such as basic gene mapping or marker assisted breeding, as it is called, are part of the monopoly claims. These methods are widely used for the selection and gene analyses of normal plants, and are used in conventional plant breeding without there being genetic alteration or transfer of single genes.

By claiming the use of the genes in important procedures in conventional breeding, the patent will broadly affect plant breeders and conventional farmers, and their access and use of seeds, all over the world. While the underlying mechanism of the biological role of the genes claimed is much too complex to be understood completely, Syngenta tries to monopolise all their functions and uses. By simply claiming that the detected gene sequences are Syngenta's invention and intellectual property, the company tries to simply lay claim to the key genetic elements of most known plant species and use of their seeds.

It appears that Syngenta knows such patents are unjustified and cannot be defended in public. After the ETC group in Canada¹⁰ exposed another application for the same patent family in January 2005, this covering basic gene sequences involved in the flowering in rice plants (W03/000904)¹¹, Syngenta swiftly announced it was dropping this specific patent application, probably to avoid any further public discussions.¹²

How to monopolise seeds by simple use of a data bank

A further step in making unjustified claims and crudely attempting to lay claim to the most important part of the genome of plants, especially rice, was made by World Patent application WO 03/048319. In this patent Syngenta simply makes explicit use of the data bank for the rice genome (see above) which was established with the support of the US company, Myriad. There is no doubt that this data bank was meant to create monopolies from the outset (see also reference to criticism made by John Sulston, above). In December 2001 Syngenta Biotechnology Inc. and Myriad

¹⁰ „ETC group is dedicated to the conservation and sustainable advancement of cultural and ecological diversity and human rights. mainly deals with issues related to modern technologies such as genetic engineering and nanotechnology..” see <http://www.etcgroup.org>

¹¹ See also Oldham, P, 2005, „Global Status and Trends in Intellectual Property Claims: Genomics, Proteomics and Biotechnology”, ESRC Centre for Economic and Social Aspects of Genomics (CESAGen), United Kingdom, [esagen.lancs.ac.uk/resources/docs/genomics-final.doc](http://www.esagen.lancs.ac.uk/resources/docs/genomics-final.doc) or <http://www.biodiv.org/doc/meetings/abs/abswg-03/information/abswg-03-inf-04-en.pdf>

¹² <http://www.etcgroup.org/article.asp?newsid=502>

Genetics announced completion of the draft sequence of the rice genome. Myriad Genetics received \$3 million from Syngenta for completing the mapping six months ahead of schedule. Myriad is supposed to receive 50% of the profit generated from exploiting the genome data.¹³

The only "invention" in patent application WO 03/048319 is a comparison made between the genomic data discovered by Syngenta/Myriad's rice genome project and some already established data banks (by other researchers) on other plants species where functions of similar gene sequences are described. Through making this simple comparison the company claims as its "invention" all gene sequences corresponding to those in the rice genome which might be responsible for abiotic stress tolerance, enhanced yield, disease resistance and better nutritional quality. Further still (see patents above), all gene sequences similar in structure or function are claimed, in all other existing plant species all over the world. All uses of the gene sequences will thus be monopolised by Syngenta's patent, no matter whether they concern methods of gene transfer, other biotechnological methods or conventional plant breeding.

Worldwide concerns raised about seed patents

A process of concentration has taken place during the last ten years in the field of plant breeding – parallel to the extension of patent protection laws on seeds. Those having profited from this development are a few agricultural corporations - DuPont, Monsanto, Syngenta and Bayer, all of them companies with their origin in the chemicals business and now top of the list of the seed multinationals. Big players in the million dollar game centred around the fight for patents, a game which can only be won by those who buy up their competitors and secure additional exclusive rights.

By the end of 2004, about 400 patents on plants and seeds had been granted by the European Patent Office alone. Several thousand applications for patents on seeds are

awaiting authorisation at the Office. Well over a thousand patents on seeds are already valid worldwide.

Patents on seeds, plants and parts of genes are seen not only as a driving force in the global concentration in the seed market and its takeover by agrochemical companies, but also as a severe restriction to access to plant genetic resources which are necessary for research and plant breeding and a precondition for securing world food.

Because of the generally negative effects of patents in plant breeding, the UK Commission on Intellectual Property Rights explicitly advises developing countries to completely ban patents on plants and seeds (UK Commission on Intellectual Property Rights, 2002, Integrating Intellectual Property Rights and Development Policy, <http://www.iprcommission.org>)

The Rockefeller Foundation and the UNEP are also among those who warn against the consequences of patenting, especially for poorer countries. A publication in the February 2003 issue of *Nature*¹⁴ also views the situation as dramatic. In parallel to private copyrights becoming extended, funds for public research have been drastically cut. At the same time, patenting has made access to genetic resources more difficult. Seeds are becoming too expensive, especially for developing countries. If this trend isn't halted, some experts maintain, tomorrow's supercrops may end up like many of today's medicines: priced out of the reach of much of the developing world's growing population. "We are headed down the same path that public-sector vaccine and drug research went down a couple of decades ago," says Gary Toenniessen, director of food security at the Rockefeller Foundation in New York. (Knight, J., 2003)

Greenpeace, Swissaid and the Berne Declaration demand:

- No patents on life
- A worldwide ban on patents on seeds
- Syngenta to drop its worldwide patent applications on parts of the genome of food crops

¹³ Myriad Genetics 2001. Myriad Genetics and Syngenta complete rice genome map. News Release - 26-Jan-2001. <http://www.seedquest.com/News/releases/usa/myriad/n3283.htm>.

¹⁴ Knight, J., 2003, "Crop improvement: A dying breed" *Nature* 421:568-570