



Seeds of Controversy

Development organizations might be the only way for poor farmers in Asia to access the seeds being developed by private companies

BY John Berthelsen

In the 1970s, a microbiologist working for General Electric Co. named Ananda Mohan Chakrabarty developed a bacterium that could treat oil spills, later coined the “oil-eating bacteria” and used to clean up the Exxon Valdez disaster. Chakrabarty was initially denied a patent because the law stated that living things were not patentable. The case, *Diamond v. Chakrabarty*, made it to the United States Supreme Court in 1980. The justices set off a revolution in bioscience by ruling that a “live, human-made micro-organism is patentable.”

Since the controversial decision, thousands of patents have been granted for genetically modified organisms. The World Health Organization defines these creations as organisms with genetic material that has been altered in a way that does not occur naturally.

In 1982 in Missouri, scientists from Monsanto Co., which had been largely a pesticide company up to that time, became the first to modify a plant cell. The discovery marked a new era for food technology. Today, the company holds more than 700 patents for food-

related products and is a leader in bioscience.

Other agribusiness giants followed Monsanto. Their seed varieties share at least one controversial feature: they obligate farmers, after centuries of reusing seeds, to buy new seeds every year. The corporations say patenting seeds, requiring they not be reused and suing farmers who violate this policy, is vital to the health of agriculture.

“Monsanto patents many of the seed varieties we develop,” the company says in a statement. “Patents are necessary to ensure that we are

PICTURE CREDIT: BRUCE MCCLELLAND

paid for our products and for all the investments we put into developing these products. This is one of the basic reasons for patents.”

“A more important reason is to help foster innovation,” the company continues. “Without the protection of patents there would be little incentive for privately owned companies to pursue and reinvest in innovation. Monsanto invests more than \$2.6 million per day in research and development that ultimately benefits farmers and consumers. Without the protection of patents, this would not be possible.”

Worldwide, plants are covered by a series of laws and regulations that

support for traditional farming—not global agribusiness—is the key to reducing malnutrition and hunger.

“Some agricultural corporations want global monopolies on human food,” notes Greenpeace consultant Christoph Then, who contributed to a report on the topic last year. “In this way just corporations now control two-thirds of the global seed market. These patents are theft of what farmers achieve in breeding. We need clear legal regulations prohibiting patents on seed and farm animals.”

Agribusiness companies and their allies note that it will be impossible to feed what are likely to be billions

“I do think it is important to clarify a bit,” said Robert Zeigler, director general of the International Rice Research Institute (IRRI) in the Philippines. “First, nobody forces a farmer to buy seed. When the farmers buy, they sign an agreement that they will not reproduce it for the next generation. Nobody is saying they have to buy from Monsanto. I am not trying to defend Monsanto, but we should note that.”

“In terms of hybrids,” Zeigler says. “It is important to be aware that farmers replacing their seeds every year can be a good thing, if it is high quality, disease-free, free of weeds. Farmers are assured of a market for



allow companies to enforce patents with lawsuits and rigorous inspections of farmers’ fields.

GLOBAL FOOD MONOPOLIES

The morality of enforcing patent law is complex when set against the backdrop of soaring populations and dwindling food stocks that could starve hundreds of millions of people. About 790 million people in the developing world are chronically undernourished. Almost two-thirds of them live in Asia and the Pacific, according the World Resources Institute. Activist groups say that

of people by 2050 without genetically modified crops. Private industry involvement, they say, is crucial. While three out of four of the world’s poor live in rural areas, according to the *World Development Report 2008*, only 4% of direct aid goes to agriculture in poor countries.

This puts large agribusiness, reviled as it is by some, at the forefront of increasing the world food supply. Investment is being made in so-called climate-ready crops, which can resist the effects of global warming and tolerate flooding, salinity, and infestation.

SOWING THE SEEDS OF TRADITION

The Philippine rice terraces, carved out from the mountain by the Igorot tribe some 5,000 years ago, were declared a genetically modified organism (GMO) free zone by Greenpeace volunteers in 2009.

their harvest because these grains have the quality that the market demands. It makes good economic sense. Being forced to buy every year is not necessarily a bad thing.”

LINKING POOR FARMERS TO EXPENSIVE RESEARCH

So how, if governments can't or won't fund research for agriculture, is a public-private partnership possible? Over the last 20 years, the World Bank has financed more than \$2.5 billion for agricultural research in developing countries. The bank claims a 175% to almost 900% return on investment.

In particular, the World Bank has supported the Consultative Group on International Agricultural Research, an alliance of 24 developing and 22 industrialized countries, four private foundations, and 13 regional and international organizations. The organization, known by its initials CGIAR, provides funding, technical support, and strategic direction for agricultural research. It also joins together 15 international research centers that work to connect private company research to those who need it most.

Comprising more than 2,000 scientists, the alliance allows for efficient access to expertise and enables the centers to tackle complex problems and negotiate authoritatively with governments and activist groups. CGIAR centers invest more than \$500 million yearly in development research in some 100 countries. This allows the group to take collective action no single center could match, according to proponents.

CGIAR centers include everything from the International Potato Center and the World Fish Center to Nobel laureate agronomist Norman Borlaug's International Maize and Wheat Improvement Center.

Also among the prominent centers is IRRI, which is headquartered in the Philippines and operates in 14 countries. It started in the 1960s with its IR8 short-stem rice variety and has since been credited with dramatic increases in rice production.

IRRI has played a role in bringing proprietary research into the public sphere, acting as a sort of "interface," as one staffer notes.



“Nobody forces a farmer to buy seed”

— Robert Zeigler, director general of the International Rice Research Institute in the Philippines

“We are in the business of research, and we have developed relationships with the private sector,” says IRRI’s Zeigler. Because rice is almost exclusively locally grown by farmers who historically save their seeds each year, he says, multinationals have little incentive to become involved. IRRI and other publicly funded research institutes have taken on the mandate to deliver advances in production.

Now, however, more scientists in more places are trying to address the problem. Among the most eager to embrace genetically modified crops, Chinese scientists have created a hybrid rice that is catching researchers’ attention.

The rice varieties, called Huahui 1 and Bt Shanyou 63, resist the rice stem borer, an insect that burrows inside the stalk, ruining the plant while hiding

from pesticides. The Government of the People’s Republic of China (PRC) is now conducting field trials. The rice could be growing on farms next year.

“Because of the sequencing of the rice genome and because of the viability of commercially hybrid rice as demonstrated in the PRC, the private sector sees an opportunity to tap into the world’s largest grain crop for human consumption,” Zeigler explains. “It is a huge market that before was not attractive.”

Private companies will never directly serve poor farmers, IRRI says. However, some companies are willing to donate patented varieties in certain circumstances. This practice should be encouraged when it is mutually beneficial, IRRI says.

DEVELOPING PARTNERSHIPS

The best model for the development of rice varieties, according to Zeigler, has been the Hybrid Rice Development Consortium, an association of 20 private companies and another 20 national institutions working on product development, evaluation and testing, and profit distribution.

“We are still early in the learning phase of this kind of partnership,” Zeigler says. “Seed is just one area where there is the potential for partnerships. Others include creating better fertilizer and water management.”

One low-tech innovation, which Zeigler calls “almost mind-numbingly simple,” consists of short plastic tubes developed by with Swiss agribusiness giant Syngenta.

“Rice is typically grown under standing water,” Zeigler says. “It doesn’t need it for the whole life cycle. Water’s most important function is to control weeds. So we developed these PCV tubes with Syngenta. The surface may be dry but the farmer can monitor his water use by looking into the tube. If it’s dry, he can add more water. If it’s wet, he knows not to add water. It can cut water

PICTURE CREDIT: AFP

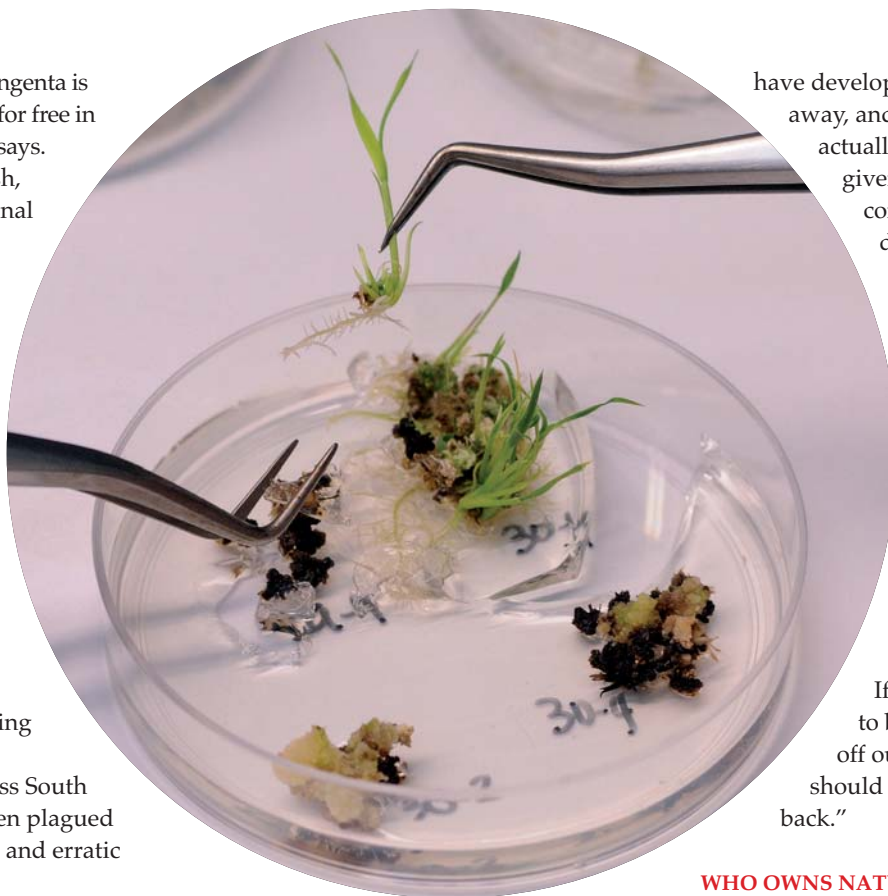
use enormously." Syngenta is giving out the tubes for free in Bangladesh, Zeigler says.

In Andhra Pradesh, India, the International Crops Research Institute for the Semi-Arid Tropics, another CGIAR center, has been doing similar work. The organization works on increasing yields in sorghum, groundnuts, pearl millet, and chickpeas, which dryland farmers grow. These struggling farmers work on marginal lands across South Asia and Africa, often plagued by poor soil fertility and erratic rainfall.

The institute, known by the acronym ICRISAT, has partnered with 50 companies in Brazil, Egypt, India, Indonesia, and Mexico to deliver improved hybrid seeds to poor farmers. Its private industry partners benefit by accessing breeding material from the farmers. This approach develops improved seeds that are available to poor farmers and improves agricultural research capabilities.

"We both benefit," says Mangala Rai, director general and joint chairperson of ICRISAT and its companion organization, the Indian Council of Research. "The private companies get the advantage of scientific research and solutions to technical problems they may face. It has been advantageous for us because we don't develop the final product, and it is advantageous to them because they don't produce the intermediate product. We do one part; they do the other."

The developing world is changing fast, Rai says. "What was done 10



have developed we have given away, and some partners have actually turned around and given licenses to private companies for them. I don't want to point fingers, but it has made us realize that unless we are proactive in the process, we could be taken to the cleaners. If a company is going to use our technology and extract value, it is legitimate for us to participate in it. If someone is going to be making a profit off our technology, they should be willing to pay it back."

GENETICALLY ALTERED

Newly germinated rice is separated from the gelatinous tissue that secures the plant to the dish. Soybean DNA, rich in iron, is introduced into the plant. This process makes the genetically altered rice able to store more iron, thus becoming more nutritious. This gene-splicing technique is adaptable to any strain of rice.

years ago is not done today. We have to change, but how do we know what farmers want? We learn through the seed companies."

The institute works to prevent the fruits of their work from being patented by private companies with a series of guidelines for dealing with private industry in crop improvement research.

Protection of research is important, says Zeigler. "One thing that has concerned us is that some hybrids we

WHO OWNS NATURE?

Activist groups and many farmers' organizations are less optimistic about the possibilities of linking private industry research to the needs of the poor. They see it—as the Canadian environmental organization ETC Group puts it—as a "corporate grab that extends to all of nature."

In a 2008 report, titled *Who Owns Nature*, the group stated that the handful of companies that control most of the world's seed sales will not help impoverished farmers unless direct pressure is applied. "There is vast and growing resistance to the dislocation and devastation caused by the agro-industrial food system," says Silvia Ribeiro of ETC Group. "In the global struggle for food sovereignty, the playing field isn't level but the scope of resistance is massive—peasant farmers, fisher people, pastoralists, and allied civil society and social movements are fighting for locally controlled and socially just food and health systems." ■