

From 10,000 Grains, One Grain

By Edward Esko

“For every new engineered seed that makes it to field trials, 10,000 failed during the development.” — Peggy G. Lemaux, A Scientist at the University of California, Davis, From an Address to the Annual Rice Growers Meeting in California

The Visitor’s Center at Lake Oroville sits high above the Sacramento Valley in the foothills of the Sierras. Like most days in the Valley, the weather is clear, sunny, and warm. Perfect for growing rice. The Sacramento Valley, which stretches off toward the West, is the leading producer of organic brown rice in the United States. Alex Jack (author of *Let Food Be Thy Medicine*) and I stand on the upper deck of the observation tower and trace the pattern of rivers flowing down from the Sierras. The panorama is breathtaking. Streams and rivers flow steadily downward from the high mountains. Their energy gathers several hundred feet below us in Lake Oroville.

Lake Oroville was created following construction of Oroville Dam in 1968. Made of earth, the dam rises seven hundred feet above the bed of the Feather River. Rice cultivation requires a steady supply of water. Lake Oroville is the source of water for the rice fields in the Sacramento Valley.

Sandwiched between the Pacific Ocean and the Pacific Coastal Range to the West, and the Sierra Nevadas to the East, the Sacramento Valley is charged by natural energy. To the North lie Mount Shasta and the Cascades.

Mountain ranges are the earth’s energy meridians. They are formed by the upward push of energy generated by the earth’s rotation. Rivers are ley lines that channel energy from the mountains. Farmers in the Sacramento Valley further channel this energy through a vast network of canals that crisscross the Valley and irrigate the rice fields. The successful channeling of this mountain energy has made California an agricultural powerhouse, both for conventional and organic farming.

The reason for my visit to California is to meet with organic rice farmers to discuss the status of genetically altered rice. Alex Jack and I are planning to meet with Grant Lundberg, the C.E.O. of Lundberg Family Farms. The Lundberg family has been growing rice since 1937. Today, Lundberg Farms is the largest distributor of organic brown rice in the United States.

There are currently a dozen varieties of genetically modified (GM) rice in development around the world. If GM rice comes into the Sacramento Valley, there is a danger of genetic pollution caused by GM pollen drifting into the organic fields and contaminating the organic crop. America could lose its primary source of organic brown rice. Heirloom rice that has nourished humanity for thousands of years could conceivably vanish. Like wheat, barley, and the other cereal grains, rice is at the center of the human

evolutionary spiral. Fifty-one percent of the world's population consumes rice as daily staple. Grains are the cornerstone of our agriculture, diet, and civilization. The genetic engineering of such an essential food could have negative implications for our entire planet.

On the following day, we set out for our meeting. On the drive from Oroville to Richvale, the home of Lundberg Farms, there are rice fields as far as the eye can see. Off in the distance are metal silos used for storing the rice crop. It is early summer, and the rice resembles tall green grass. Surrounding the fields are irrigation ditches in which cattails grow. Dragonflies swarm above. The ecology is that of a freshwater marsh.

Upon arriving at Lundberg Farms, we locate Grant Lundberg's office in a small shed next to the main office building. After shaking hands, Grant leads us into his office. We begin by introducing ourselves and thanking the Lundbergs for their pioneering efforts in developing and promoting organic rice. Alex then presents a scenario in which a dozen varieties of GM rice are introduced around the world. Grant is well aware of the plans for GM rice. He obviously shares our concerns. We then ask how California farmers plan to deal with this threat.

Grant explains that farmers in California are wary of GMOs (genetically modified organisms.) Some, like the Lundbergs, are opposed to GMOs for philosophical reasons. Others are concerned about their economic implication. Rice farmers know that the vast majority of American consumers favor labeling of GMOs. Moreover, forty percent of the California rice crop is exported, mostly to Japan. The Japanese recently passed a law requiring that all GM products be labeled.

These concerns prompted California farmers to work with state legislators in Sacramento to pass a "seed certification law." The law requires that GM crops be strictly segregated from conventional and organic crops. Grant expresses his hope that the seed certification law will at the very least protect non-GM organic and conventional crops from genetic contamination.

The biotech industry has ambitious plans for California rice. Their hope is to see 40 percent of the California crop be GM by 2010. The first two varieties of GM rice set for introduction in California are the herbicide tolerant varieties "Liberty Link," developed by AgrEvo, and "Roundup Ready," developed by Monsanto. Herbicide tolerant rice is genetically engineered to accept high levels of "Liberty," the herbicide marketed by AgrEvo, and "Roundup," the herbicide marketed by Monsanto.

Grant then contrasts the Lundberg method of organic weed control with the use of Roundup and other toxic herbicides. During the summer, the Lundbergs drain the water from their organic fields. The bright sun shines down on both weeds and rice plants. The weeds dry up but the rice flourishes. The fields are again flooded and the rice continues growing without competing weeds—a totally natural method of weed control.

Several days later, after returning to Massachusetts, I notice the latest edition of Time magazine. The cover features a photo of a Swiss Professor named Ingo Potrykus with his beta-carotene-enriched rice. The headline states, "This Rice Could Save a Million Kids a Year. . . but protesters believe such genetically modified foods are bad for us and our planet." So-called "golden rice," an unnatural transgenic "food," contains beta carotene producing genes from daffodils and a certain type of bacteria. For many years, Potrykus has been waging a one-man campaign against brown rice; claiming it is nutritionally deficient. However, beta carotene is present in the outer coat of brown rice; the part that is removed when it is milled into white rice. Most of the nutritional deficiencies in underdeveloped countries occur because people eat white, rather than brown rice, and not enough green leafy and orange-yellow vegetables.

Scientists such as Potrykus begin from a false premise. They believe nature is imperfect and can be improved upon. Such blindness inevitably leads to downfall. Nature is and always will be a perfect system. However, in the case of "golden rice," this blindness is being presented under a humanitarian guise. I hope people are not fooled.

Rice farming in the Sacramento Valley has been going on for over a hundred years. GMOs are simply not needed; they interfere with the natural order and make things unnecessarily complicated. They are more of a problem than a solution. There are far better solutions to hunger and malnutrition than genetic engineering. GMOs divert attention from the root cause of these problems and make finding solutions more difficult. During our meeting, Grant, Alex, and I agreed that things would be much better if GMOs simply went away.

However, the reality is that they are not going to go away, at least not in the near future. Therefore, we must remain vigilant; we must make our choices and our voices heard. Together we can send a strong message that we wish to see nature respected on all levels.

Nature operates according to the principle of "one grain, ten-thousand grains." For every seed the earth receives, it returns thousands. Nature is forever productive, and infinitely diverse. In the practice of genetic engineering, ten-thousand seeds are sacrificed for every one that comes to market, or "from ten-thousand grains, come one grain." Originally, the heirloom seeds that sustained humanity over the centuries cost nothing; they were given freely by nature. Each genetically engineered seed costs \$300 million to bring to market. We now face a choice between two opposite views of life, one natural, the other artificial. The health and happiness of future generations, indeed the health and happiness of all species, could well depend upon which of these two paths we choose.

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