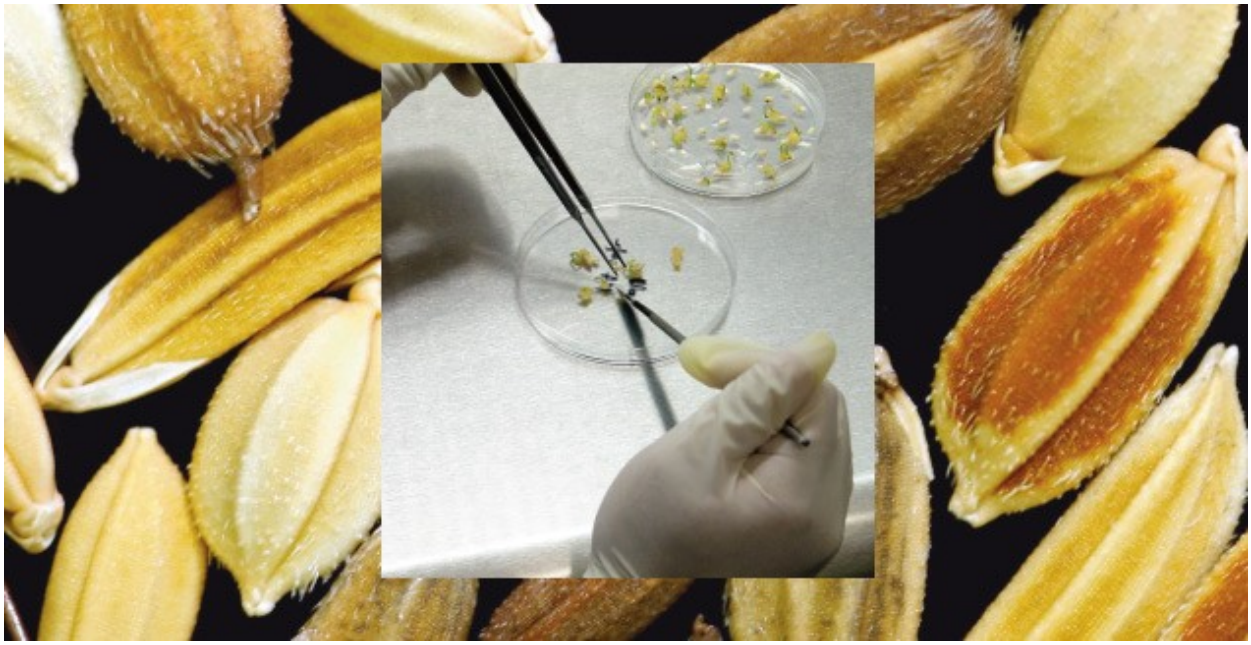

Working on rice calli

She points out that billions of acres of GE crops planted over the past decade have a spotless environmental record while conventional farming methods do not. Toxic pesticides used on conventional farms pollute the air, soil, and groundwater, and are estimated to kill 300,000 people every year. "It's a strange paradox that much of the public accepts the use of toxic pesticides," she says. "Even people who support organic agriculture end up eating food that has been sprayed with toxic pesticides. They're accepted because they're familiar."

She's quick to say that while current GE crops are safe, it doesn't mean that all GE crops in the future will be safe. "We have to take it on a case by case basis," she explains. "It's not the process of introducing genes—whether you do it by breeding or with genetic engineering—that matters. The critical aspect is what trait you are putting into the plant. How do we want to use this powerful technology to create a more sustainable agriculture?"

Ronald is a passionate advocate, not just for genetic approaches to ecological farming, but for using the right tools to solve specific problems. In *Tomorrow's Table*, she and her husband Adamchak contend that the future of sustainable agriculture lies in the marriage of genetic technology and organic farming.

Organic farming, which represents approximately two percent of U.S. agriculture, struggles to combat certain pests and diseases. Yields are also often much lower than those of conventionally farmed crops, which makes organic crops less profitable and more expensive, requires more land and water, and limits their ability to feed the world's burgeoning population.

Adamchak, an organic farmer who holds a master's degree in international agricultural development and manages the student organic farm at UC Davis, sees potential in genetic engineering. "Organic farmers employ sustainable practices," he says, as he and a student hoe long rows of spinach under the hot sun.

"But we have pests and diseases that are hard for us to deal with. Genetic techniques can make plants more pest-and disease-resistant and tolerant to flood, drought, salt, and cold. GE could be huge in helping us to maintain yield. It could make organic farming even better."

That isn't likely to happen anytime soon. In the United States, organic farmers are prevented by law from selling genetically engineered crops. Back in 1990, the Organic Foods Production Act established national standards for foods labeled as "organic." Due to public pressure, genetically engineered organisms constitute an "excluded method" and are not allowed.

(In fairness, it's worth remembering that U.S. law does not require GE food to be labeled as such. In practice, buying organic food is the only way consumers can avoid unwittingly consuming GE food.)

As the mother of two young children, Ronald understands that many parents are anxious about genetic engineering; she sees it as a tool for achieving the goal of sustainable farming. Focusing on the tool rather than on the goal, she says, is like being preoccupied with the hammer rather than building the house. She prefers to concentrate on the broad goals of sustainable farming: reducing fertilizer runoff and use of toxic pesticides; using practices that foster topsoil retention; producing food that's nutritious; and feeding the poor and malnourished.

"I want us to use the most appropriate technology to solve our agricultural problems," she says. "Sometimes that'll be genetically engineered crops; sometimes it won't."

That kind of creative thinking was fostered by Ronald's years at Reed. She points to mentors like professors Peter Russell, Laurens Ruben, and Helen Stafford, who "really gripped my imagination. A lot of talented people at Reed made me believe in the power of the individual—that one person can make a difference."

Ronald has taken that lesson to heart. She's making a difference to farmers the world over, one grain of rice at a time.

Award-winning writer and avid gardener Bobbie Hasselbring frequently profiles interesting people. This is her first story for Reed*.*

A Heavyweight in Genetic Science

Pamela Ronald '82 is a nationally and internationally recognized expert in plant genetics and genetic engineering. Here is a sampling of her credentials:

BA and MA degrees in biology (Reed/Stanford University).

MS in plant physiology (University of Uppsala, Sweden).

PhD in molecular and physiological plant biology (UC Berkeley).

Postdoctoral fellow in plant breeding at Cornell University.

Physical Biosciences faculty member at the Lawrence Berkeley National Laboratory.

Fulbright Distinguished Chair in Natural Sciences and Engineering at the Hebrew University of Jerusalem.

Elected Fellow of the American Association for the Advancement of Science.

Sits on the editorial boards of prestigious publications, including the *Journal of Plant Biology*.

Author of 85 peer-reviewed articles in *Science, Nature* and many other scientific periodicals ; her work has also been featured in popular publications like *The New York Time* and *The Wall Street Journal* and on National Public Radio.

Winner of the USDA's 2008 Discovery Award, its highest award, for her work in developing flood-tolerant rice varieties.

Further Reading:

Safety of Genetically Engineered Foods: Approaches to Assessing Unintended Health Effects, bt the Institute of Medicine and National Research Council (2004)

Tomorrow's Table: Organic Farming, Genetics, and the Future of Food, by Pamela C. Ronald and R. W. Adamchak (2008)

Mendel in the Kitchen: A Scientist's View of Genetically Modified Food, by Nina Feroroff and Nancy Marie Brown (2004)

DNA: The Secret Life, by James D. Watson and Andrew Berry (2003)

Genetically Modified Food: Changing the Nature of Nature, by Martin Teitel and Kimberly Watson (2001)

Genome: The Autobiography of a Species in 23 Chapters, by Matt Ridley (2000)

Silent Killer: The Unfinished Campaign Against Hunger **www.silentkillerfilm.org**