PHOTOS: PICO VAN HOUTRYVE

The ODD Couple

Pam Ronald embraces genetically engineered crops. Raoul Adamchak is an organic farmer. They contend both practices can form a perfect union to feed the world.

BY URBAN C. LEHNER

When organic farmers and growers of genetically engineered (GE) crops meet, they often shout past each other. "You'll have to plant half the earth and even then billions will starve if everyone farms organically," says Ms. Transgenic. "Your Frankenseeds will ruin the environment and force us all to live on Mars," retorts Mr. Organic.

Pam Ronald and Raoul Adamchak seem like ideal candidates for these roles. She's a plant pathologist specializing in genetically engineered rice. He's an organic farmer. Yet, far from clashing, they are happily married, and they think genetic engineering and organic farming should be too.

It would combine the best of both worlds, they argue in their 2008 book, "Tomorrow's Table: Organic Farming, Genetics and the Future of Food." Genetic engineering would improve yields while organic practices protect the environment. The two have been "unnecessarily pitted against each other," the book states.

It's an unusual view, to be sure. It doesn't mesh

Husband and wife Raoul Adamchak and Pam Ronald say ideology should not get in the way of finding strategies to increase food production.

with prevailing orthodoxies and it flies in the face of USDA's national organic standards, which don't allow GE crops to be certified organic. But it typifies the eclecticism this remarkable couple brings to the polarized debate over sustainable agriculture.

A BROAD APPROACH. On one side of that debate are those focused on protecting the environment. On the other are those worried about feeding the world's exploding population. Pam and Raoul, however, say agriculture must do both—plus, make farmers decent livings—to be sustainable.

No one approach—organic, transgenic or conventional—can achieve these sometimes conflicting goals. "If you want to envision workable, sustainable farming," Raoul says, "it's going to take the best of every kind of agriculture."

They came to this shared vision, as they came to their marriage, from very different places.

Pam grew up near San Francisco. Her businessman father was a Jewish refugee from Nazi Germany who arrived in California via France, Portugal and Cuba. Her mother, an avid gardener, hailed from Council Bluffs, Iowa. Pam learned a love of plants from her mother and a passion for the environment from holidays at the family's cabin in Lake Tahoe.

As an undergraduate at Reed College in Oregon she "fell completely head over heels for genetics" and spent time working on an organic farm. She received her doctorate at Berkeley, did post-doctoral work at Cornell and ended up at the University of California at Davis, where she runs a laboratory of 25 researchers.

Pam Ronald is at home in a UC Davis lab that produces transgenic rice to meet world food needs.

One of her lab's accomplishments is creating a rice plant that better weathers Asia's floods. They took a gene from an Indian rice variety that can survive two weeks underwater and implanted it into a higher-yielding variety that only could stand a week's submergence. The result: the potential to feed an additional 30 million people a year.

Raoul, the son of a schoolteacher and a housewife, grew up in Toms River in southern New Jersey. He studied economics at Clark College in Massachusetts, where his graduate program included an internship in Honduras to help small-scale farmers. The interns never actually traveled to Honduras, but the organic-farming training they received in southern California launched Raoul into agriculture.

"I became very excited about it and have been studying it ever since."

Meanwhile, he received a master's degree in agricultural development at UC Davis, where he co-teaches a course on organic farming and runs a 5-acre market garden.

Pam and Raoul met when she accompanied a friend to a lesson on rolling a kayak that Raoul was teaching. They found they had a shared goal: to solve agriculture's problems.

SUSTAINABLE PRODUCTION. To those obsessed with feeding the world, Pam and Raoul say yes, we must, but we also must solve the environmental problems of large-scale agriculture, like chemical runoff and soil erosion.

Organic farming minimizes runoff and erosion but may sacrifice yield and have other problems. Organic sweet corn comes to market with earworms despite the organic view that Mother Nature will take care of pests, Raoul notes, yet there's a transgenic Bt sweet corn that's earworm-free. Raoul would consider using it if he found it tastes good, reduces pesticide use, yields well enough to be worth the cost and meets a few other criteria. Especially critical is that "customers would have to want to eat it.

"We're not advocating that every single crop and plant be genetically engineered—only when it's the best single solution for the problem," Raoul says.

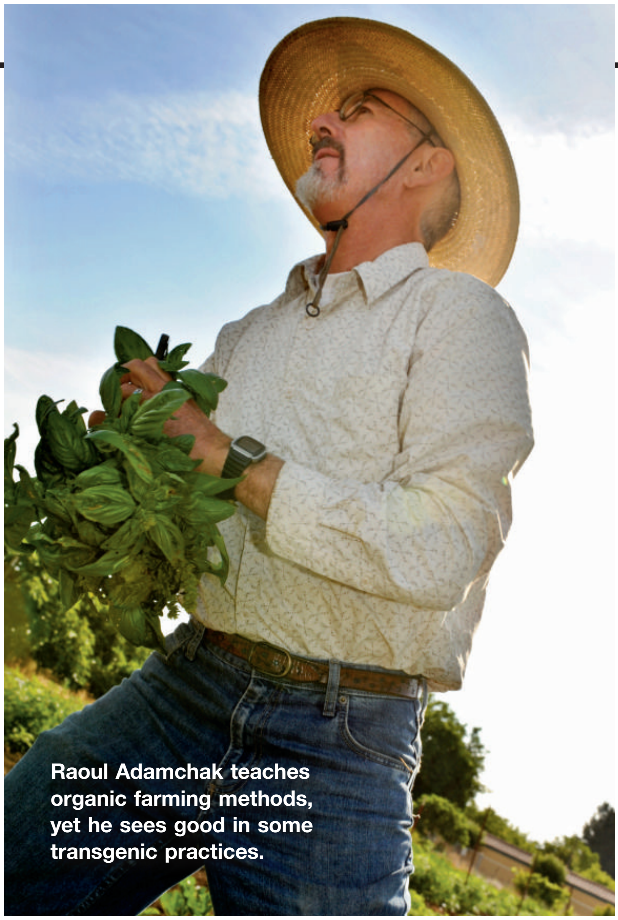
To those worried about GE's environmental implications, Pam and Raoul contend pesticide use is much worse for the environment. The year GE cotton was introduced to China, the country's pesticide use fell 150 million pounds.

One way or another, everything we eat has been genetically modified. The National Academy of Sciences and its counterparts in 17 countries say the food safety risks genetic engineering poses are similar to those of conventional breeding.

GE's opponents "really believe genetic engineering is an evil plot by corporations," Pam says. But, she adds, the underlying technology was developed entirely in nonprofit labs like hers. Big companies build on this base, and they bring products to market because only they can afford the lengthy regulatory process.

"There's genetic research being done around the world that's not being done for the profit motive. It's being done to reduce pesticide use, reduce soil erosion and improve yields," Pam says. "This research is at the cutting edge of biology. You can't just throw it out."

Ultimately, Pam and Raoul want everyone to forget ideology and judge all farming methods case by case. That's what they do at UC Davis, where, Pam notes, the seed biotechnology building is right next to the organic farm. "We get a kick out of that."



Raoul Adamchak teaches organic farming methods, yet he sees good in some transgenic practices.

GMO solution to conventional problem

One argument against genetic engineering (GE) is the potential for any problems that may affect non-GE crops. If, for example, overuse of a herbicide-tolerance trait gives rise to new herbicide-resistant weeds, the problem is everyone's, not just those who used the trait.

But there can be positive unintended consequences too. In their book, "Tomorrow's Table: Organic Farming, Genetics and the Future of Food," Pam Ronald and Raoul Adamchak recount how genetic engineering in the 1990s saved the Hawaiian papaya industry—not only for those who used the GE seeds, but for organic growers as well.

Papaya ringspot virus had decimated the industry. Up against the wall, researchers tried injecting a mild strain of the virus into the papaya genome, hoping, in effect, to vaccinate the plant and give it immunity. The tactic worked. The resulting GE plants were resistant to the virus. Within a year, 76% of papaya farmers had planted the seeds. Papaya production, which had fallen to 26 million pounds in 1998, was up to 40 million pounds by 2001.

And the organic growers? They benefited in two ways. First, there was less of the virus around once the GE varieties were introduced. Second, the non-GE plants gained protection by being placed in the center of a circle of GE papaya.

In this case, genetic engineering, the authors write, was "the most appropriate technology" to solve the problem. "There was no other technology then to protect the papaya from the devastating disease, nor is there today."

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