The Debate Continues: The Economist Hosts Debate on the Compatibility of Biotechnology and Organic Agriculture

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Currently, worldwide, the population of hungry people tops 925 million. Proponents of biotechnology believe that modified seeds and other agricultural technologies are among the most efficient means to help alleviate the number of hungry people worldwide. Advocates of organic farming, on the other hand, counter that biotechnology is overly expensive, dominated by commercial interests, dependent on expensive chemical inputs, and damaging to the environment.

Benbrook's "many little hammer" solutions include integrated crop and livestock farming; utilization of local resources and farmer skills and labor to reduce dependence on off-farm inputs; and building soil quality through compost, permaculture and other agroecological farming methods. (Photo credit: Bernard Pollack)

This week, The Economist Debates, moderated by Tom Standage, consults two experts in these fields and asks if it is possible for "two supporters of these very different approaches to find common ground, or are the differences in philosophy too great to be overcome?" The end goal is the same, notes Standage, if not the means to obtaining it.

Pamela Ronald, Professor of plant pathology at the University of California, Davis argues that genetically engineered crops will need to play an important role in alleviating global hunger—and that they can do it in a way that is environmentally sustainable. Arguing that biotechnology is not a system of farming, but instead an expensive technology that favors large-scale industrial farming and has a lot of potential to be misused, is Charles Benbrook, chief scientist at the Organic Center and contributing author to *State of the World 2011: Innovations that Nourish the Planet*.

"After 10,000 years of crop domestication and innovation," says Ronald, "virtually everything we eat has been genetically altered, and every farm today grows such crops." And there is "broad scientific consensus," she continues, "that GE crops currently on the market are safe to eat." GE crops can also increase yields (by more than 30 percent in some communities) and improve nutrition. In Africa, says Ronald, "the introduction of genetically engineered drought-tolerant corn" will be an important safeguard for small-scale farmers against increased drought caused by climate change.

But, GE crops alone cannot feed the world, says Ronald, "and the farming practices used to cultivate the seeds are equally important." If the world is serious about "building a future of sustainable agriculture," she continues, GE crops and ecological farming practices must coexist.

Conversely, Benbrook warns against putting too much stock in "single-tactic solutions to complex farming-system problems." Currently, he argues, "biotechnology on the farm consists almost exclusively of corn, cotton, and soybeans engineered to make plants herbicide-tolerant (HT) and/or resistant to certain insects." HT allows farmers to depend on one "broad-spectrum herbicide" and one large crop, reducing biodiversity on the farm and increasing the risk that diseases and pests will

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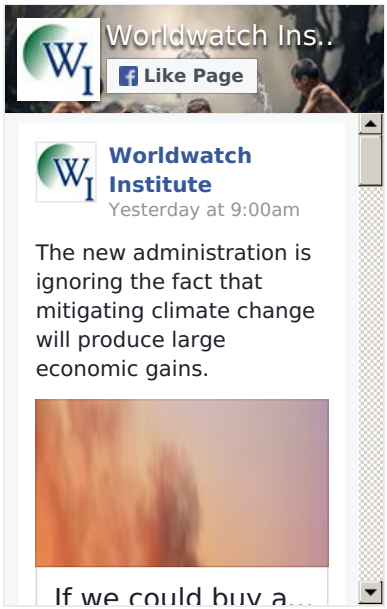

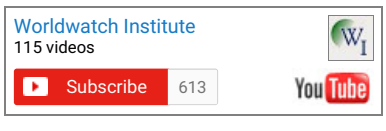

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develop resistance to that herbicide. The lesson one can learn from this single example, says Benbrook, is that "technologies that solve one problem at the expense of others cut against the grain of prevention-based sustainable agriculture."

Instead of just a few crops and herbicides, Benbrook argues that building the future of sustainable agriculture will require "many little hammers." These "many little hammer" solutions include integrated crop and livestock farming; utilization of local resources and farmer skills and labor to reduce dependence on off-farm inputs; and building soil quality through compost, permaculture and other agroecological farming methods.

"Biotechnology," allows Benbrook, "can help create new hammers and harden existing ones through marker-assisted breeding and the development of new diagnostic tools, vaccines, biopesticides and soil inoculants—but not the way it is being used today on the farm."

What do you think? The debate is still live on The Economist and you can read up-to-date responses from both Ronald and Benbrook, as well as offer your own opinion, for the rest of the week. You can also read more on this topic in the upcoming *State of the World 2011: Innovations that Nourish the Planet* as well as in the following Nourishing the Planet blog posts: Meet the Nourishing the Planet Advisory Group: Sudha Nair, Interview with Phil Bereano, Meet the Nourishing the Planet Advisory Group: Chuck Benbrook, Building Knowledge About Biotechnology in Africa, and Creating a Well-Rounded Food Revolution.

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