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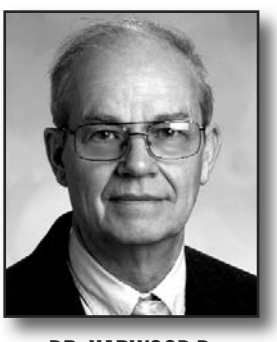
Δ **Contact Dr. Daryll E. Ray or Dr. Harwood D. Schaffer** at the UT's Agricultural Policy Analysis Center by calling (865) 974-7407,faxing (865) 974-7298, or emailing dray@utk.edu or hdschaffer@utk.edu
For more info, visit: www.agpolicy.org

Feeding The World's Hungry And Growing Population

DR. DARYLL E. RAY
Agricultural Economist
University of Tennessee



DR. HARWOOD D. SCHAFFER
Research Assistant Professor at APAC, University of Tennessee

Despite the World Food Summit goal of halving the number of hungry in the world between 1996 and 2015, the number has remained stubbornly constant, with an uptick in the number as a result of the 2007-2008 crop price hikes. Currently the official Food and Agricultural Organization 2010-2012 estimate of the number of undernourished people is 870 million, though some aid organizations offer higher estimates.

At the same time, the world's population is projected to grow from the current 7 billion to around 9 billion by 2050. Unsurprisingly, the question arises as to how we are going to feed 2 billion additional people by 2050, when we already have nearly 1 billion facing chronic hunger.

Recently we were asked to take part in a symposium at the Entomological Society of America annual meeting in Knoxville titled: "Feeding future generations: Expanding a global science to answer a global challenge." The focus of that challenge was to identify ways to feed 9 billion people in 2050. What follows in a synopsis of our presentation.

We preface what follows by noting that it appears to us that the multinational biotech seed and chemical companies have responded to this challenge by positioning their products as the primary solution to meeting this goal. Not incidentally, they are also using this challenge as a justification for pressing the case for the extension of their intellectual property rights through trade negotiations.

As a result of our readings and discussion with others, it appears to us that much of the discussion about feeding 9 billion people by 2050 has been captured by these firms by setting up a false dichotomy.

On the one side, we have what might be called the current mechanized agricultural model. In this model, the goal is to bring the latest technologies (read GMOs and agricultural chemicals) to bear on solving this problem. It is argued that through the use of patented products and technologies, US farmers can boost their production to help meet the increased demand for food.

Similarly farmers in developing nations can use these same patented technologies and products to boost their crop production. But in order to make these technologies and products available, the agribusiness firms need to make sure that their intellectual property is protected. So what the companies want to do is offer the free use of products like a GMO cassava to a country's farmers in exchange for their setting up US-style intellectual property rights and regulatory agencies in their country. The vision is to remold subsistence farmers into entrepreneurial export-oriented producers.

On the other side, they offer organic production, essentially viewing it as a post-industrial philosophical reaction to the mechanization of agriculture. They then use this reaction to describe a pre-industrial production system.

The proponents of the mechanized agricultural model go on to characterize organic production as offering lower yields and increased labor requirements as a result of higher weed and insect pressure. The argument is often summarized in the declaration that if we wanted to match current US chicken production with free-range chickens, there wouldn't be enough acres available to do that – we've never tried to make that calculation.

By positing organics as the only alternative to the full use of their products, they hope to quash any challenge to their vision. They also ignore a lot of other actions that could be helpful in meeting the challenge of feeding 2 billion additional people by 2050 – an increase of 28 percent over a 38-year period. In taking on this challenge, we need to remember that we were able to move from feeding a world population of 4 billion in 1974 to feeding 7 billion in 2012 – an increase of 75 percent over a 38-year period.

From our vantage point, one needed action is to reduce post-harvest loss, which can be as much as a quarter to a third of the crop. To do this, low-input storage technologies need to be identified that use resources that are available to farm households and can be maintained over the long-haul by the poorest of the poor.

Returning to a theme that we have touched on before in this column, we need long-term funding for conventional breeding programs that will produce public varieties of what the US National Research Council has called "lost crops:" teff, various sorghums, amaranth, fonio, African rice, millets, and various pulses. Many of these crops currently yield about 1 tonne per hectare – compared to 10 tonnes of corn per hectare in the US – while research plots have identified landraces of these crops that can yield triple or quadruple that. A conventional breeding program could breed these high-yielding characteristics back into the local varieties that would be acceptable to local households.

While intercropping would be a problem for farmers using four-wheel-drive, diesel tractors, it is more common among farmers who depend upon hand labor for their production. And intercropping has the potential to increase total food output from a given plot of land through techniques like succession planting – that is what we do when we plant radish and carrot seeds in the same row in the spring. In Colombia we saw indigenous farmers planting squash in among the hills of corn. With targeted research, intercropping systems that increase total nutritional output per unit of land could be identified using locally grown crops.

As a recent Iowa State study showed – see our November 12, 2012 column – three- and four-year rotations that includes crops and livestock can reduce the need for synthetic nitrogen fertilizers and herbicides. In some cases the task will be to help subsistence farmers recover traditional rotations that used local crops and crop varieties.

While we are not soil scientists, we cannot underestimate the importance of the issue of soil and water management. We need to pay attention to soil biotics and soil structure. Doing so could decrease water runoff, increase water infiltration, and improve nutrient availability to the plants.

None of this is difficult. The science is relatively easy. What it takes in the political will to fund programs in these areas. In saying this we are not arguing that the role of mechanized agriculture in the global North does not play a role in meeting this goal; it does. But there is more to it than that.

Oh! and we almost forgot our most important point.

The real challenge in feeding all 9 billion people in 2050 is not production; it is distribution.

Remember 1998-2001? The price of corn was $1.85 a bushel and we had 800 million hungry people in the world. But because they lacked purchasing power, 800 million people went to bed hungry while US producers were told that the low prices were caused by their "overproduction."

The first step in meeting this challenge is to enable the farmers who are among the poorest of the poor to produce their own food using sustainable technologies that are within their resource base. Δ

SDR. DARYLL E. RAY: Blasingame Chair of Excellence in Agricultural Policy, Institute of Agriculture, University of Tennessee

DR. HARWOOD D. SCHAFFER: Research Assistant Professor at APAC, University of Tennessee