

## APPENDIX 17–A

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# WE NEED BIOTECH TO FEED THE WORLD

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*Norman Borlaug was awarded the Nobel Peace Prize in 1970 for his accomplishments in agriculture. He was a professor at Texas A&M University, College Station, Texas, when he wrote this article appearing in the Wall Street Journal, December 6, 2000.*

Science is under attack in affluent nations, where antibiotech activists claim consumers are being poisoned by inorganic fertilizers and synthetic pesticides. They also claim that newer genetic engineering technologies decrease biodiversity and degrade the environment. Neither claim is true, but fear-mongering could be disastrous for less-developed nations.

Recently, in India, I confronted a move to outlaw inorganic, synthetic fertilizers. Government officials had been influenced by a cadre of international foes of technology. Officials told me that although Indian agriculture had greatly benefited from the use of such fertilizers in its Green Revolution—by which India achieved self-sufficiency in grain in the 1970s—they were now concerned that these products might have long-term negative effects. They wanted to revert to the exclusive use of so-called organic fertilizers.

They were correct about one thing—India has been the beneficiary of modern agricultural techniques. In the mid-1960s, both Pakistan and India saw widespread famine. I managed to persuade both governments to try the highly productive dwarf wheat and the improved integrated crop management practices that my colleagues and I developed at the International Maize and Wheat Center in Mexico.

The results speak for themselves: In 1965, wheat yields were 4.6 million tons in Pakistan and 12.3 million in India. By 1970, after the introduction of our new wheat, Pakistan produced nearly twice its amount, while India

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*Source: Wall Street Journal. We need biotech to feed the world. New York, NY: Wall Street Journal; December 6, 2000. FoodBiotechNet, a partnership of the Council for Agricultural Science and Technology ([www.cast-science.org](http://www.cast-science.org)), the Georgetown Center for Food and Nutrition Policy ([www.ceresnet.org](http://www.ceresnet.org)), and the International Food Information Council (<http://www.ific.org/>); Washington, DC; 2000.*

increased its yield to 20 million tons. The trend continues. This year Pakistan harvested 21 million tons, and India 73.5 million—all-time records.

This salutary trend will be reversed if misguided bureaucrats have their way. Such a law as India proposed would have seriously diminished the country's ability to feed its one billion people. Famine would again rear its ugly head.

The citizens of affluent nations may be able to pay more for food produced by "natural" or "organic" methods. The chronically undernourished people of impoverished nations cannot. They also cannot afford to have the promise of new agricultural technology nipped in the bud, as many anti-biotechnology activists wish.

The latter have been agitating about the supposed threats to human health engendered by bioengineered foods. But such foods pose no greater threat to health than foods produced by conventional methods—probably even less. While activists inveigh against introducing a gene from one plant or one species into another, they fail to note that conventional breeders have been doing just that for many years.

Today we do it better. In the past, conventional plant breeders were forced to bring unwanted genes along with desirable ones when incorporating insect or disease resistance in a new crop variety. The extra genes often had negative effects, and it took years of crossbreeding and selection to oust them. Conventional plant breeding is crude in comparison to the methods being used in genetic engineering, where we move one or a few genes that we know are useful. We must do a better job of explaining such complexities to the general public, so people will not be vulnerable to anti-biotech distortions.

Some environmental extremists bewail the use of genetic modification that allows crops to be herbicide resistant, or others that allow plants to produce their own insecticide. Among other charges, they suggest that herbicide resistance might be passed to wild relatives of the crops, and that insecticide-producing plants will decimate insect life and decrease biodiversity.

The truth is that resistance genes bred into crops by conventional means could also be spread to wild relatives by Mother Nature herself. Steps can be taken to minimize the possibility of that happening. Further, the suggestion that insecticide-producing plants will wipe out insects like Monarch butterflies is truly far-fetched. The most likely threat to the butterflies is a reduction of their winter habitat by encroaching land development in Mexico.

What the activists don't want people to know is that one very good way to protect wildlife habitat is to ensure that marginal lands are not pressed into agricultural service in an attempt to feed burgeoning populations. In 1960 in the US, the production of the 17 most important food, feed, and fiber crops was 252 million tons. By 1999 it had increased to 700 million tons. It is important to note that the 1999 harvest was produced on 10 million fewer acres than were cultivated in 1960. If we had tried to produce the harvest of 1999 with the technology of 1960, we would have had to increase the cultivated area by about 460 million acres of land of the same quality—which we didn't have.

It is this type of arithmetic that is so important when considering how to feed the world's ever-increasing population. In 1914, when I was born, there were about 1.6 billion people in the world. Now it's about six billion, and we're adding about 85 million each year. We will not be able to feed the

people of this millennium with the current agricultural techniques and practices. To insist that we can is a delusion that will condemn millions to hunger, malnutrition and starvation, as well as to social, economic and political chaos.

I visited Russia recently and spent some time at the newly renamed N.I. Vavilov Institute of Genetics and Crop Breeding in St. Petersburg. As I was leaving the conference room, a professor emeritus pulled me aside and pointed to the red chair at the head of the conference table, which was unoccupied during our meeting. "That's where Trofim Lysenko sat for 12 years when he destroyed our agricultural research programs and sent many of our top scientists to prison camps." T.D. Lysenko, of course, was the pseudo-geneticist who insisted that Soviet agriculture must be run along politically correct party lines. Many who disagreed with Lysenko, including N.I. Vavilov, perished in prison camps. I fear that, like Lysenko, those ideologically opposed to technological advances will unduly influence our government and developing nations, as they have almost succeeded in doing in India. If they do, our prospects for feeding the world will be dim indeed.

I believe the world will be able to produce the food needed to feed the projected population of about 8.3 billion in the year 2025. I also believe that it can be done with little negative impact on the environment. But it cannot be attained without permitting the use of technologies now available, or without research to further improve and utilize new technologies, including biotechnology and recombinant DNA.