

2007 Norman E. Borlaug/World Food Prize International Symposium
Biofuels and Biofoods: The Global Challenges of Emerging Technologies
October 18-19, 2007- Des Moines, Iowa

SESSION II. INDUSTRY, POLICY, AND SUSTAINABILITY

October 18, 2007 – 2:00 – 4:30 p.m.

Moderator: Gregory Geoffroy

Speaker: Christopher Policinski

Gregory Geoffroy

President, Iowa State University

World Food Prize Council of Advisors

Our next speaker is Chris Policinski, who is CEO of Land O'Lakes Incorporated, one of the world's preeminent farmer-owned cooperatives, offering products and services in crop production, animal nutrition and food processing in all 50 states and 50 other nations.

Land O'Lakes is the world leader in animal milk replacers and alfalfa seed, the largest feed company in North America, and the largest distributor of agronomy products in the United States. Land O'Lakes has also demonstrated global leadership in supporting food security, rural development and food-quality assurance in developing countries.

Prior to joining Land O'Lakes in 1997, Mr. Policinski served in top management positions in Dairy Foods, Kraft, General Foods, Pillsbury and other companies. He's on the President's Council of the Grocery and Manufacturers of America, is chairman of the nonprofit organization, Prosperity Worldwide and is a member of the board of directors of the National Milk Producers Federation.

Mr. Policinski has an MBA degree from New York University and a Bachelor's in Business Administration from the University of Notre Dame. Please join with me in welcoming Mr. Policinski to the podium.

Christopher Policinski

President and CEO, Land O'Lakes

Good afternoon, and thanks, Dr. Geoffroy, for that very generous introduction. Let me start my comments by expressing my appreciation for the opportunity to share this podium with such a distinguished group of scientists, policymakers and industry leaders who have come from around the world to participate in this event.

And I'd like to specifically express my gratitude to John Ruan III and Ambassador Kenneth Quinn for inviting me to be part of this program. I've been privileged to work with John in a business setting, and I appreciate the fact that the level of commitment that he brings to his business dealings is reflected in the passionate support that he and this family provide this program.

Similarly, Ambassador Quinn has, over the past seven years, proven to be a persuasive spokesperson for the World Food Prize. His reputation has opened many doors for the Foundation.

I'd also like to take just a moment to pay tribute to Dr. Norman Borlaug, namesake of this symposium, founder of the World Food Prize, and one of only a handful of individuals to receive the Nobel Peace Prize, the U.S. Presidential Medal of Freedom, and the Congressional Gold Medal. Here in Iowa they take special pride when a native son receives worldwide recognition, and that recognition was well earned by this accomplished scientist who led the Green Revolution, leveraging science and technology to help develop high-yield, disease-resistant wheat varieties, literally saving the lives of millions around the globe.

In my home state of Minnesota, we hold a special place in our hearts for Dr. Borlaug as well, who earned his doctorate in plant pathology and genetics from the University of Minnesota back in 1942.

Like all of us here, I personally admire his ability to look at the issue of feeding the hungry and growing world population. And instead of dwelling on all the reasons why it couldn't be done, he rolled up his sleeves and got down to the business of determining how to get it done.

Now, I believe we need to bring this same optimistic, can-do spirit to the challenge facing us today. Despite the complexity of the task at hand, we must determine how we can successfully meet our global food needs while also addressing the growing demand for biofuels. Instead of dwelling on and arguing about why it can't be done, we must instead focus our attention on how best to get it done.

In fact, if there's one thought I'd like to leave you with today, it's this: Our success in meeting this challenge will depend on taking a rational and science-based approach on the issues we face. We must set aside emotion, politics, and other personal and organizational agendas and truly focus on the task at hand.

I am convinced that if we approach this challenge with the proper perspective, with an appropriate sense of balance and with the same science-based approach and energy that Dr. Borlaug has brought to all of his work, we will succeed.

Now, that positive focus is in fact what's driven Land O'Lakes' longstanding commitment to addressing the issue of hunger. At home we do this primarily through the work of the Land O'Lakes' Foundation. Abroad, our International Development Division works with organizations like the U.S. Agency for International Development or USDA's Foreign Agricultural Service to both provide direct nutritional assistance and help build the agricultural infrastructure in disadvantaged or developing regions or economies.

In fact, our International Development Division has 275 staff working worldwide. Since being established in 1981, it has deployed over \$230 million in more than 140 projects in 70 countries. Last year alone we helped feed 400,000 school children in such needy areas as Pakistan, the Philippines and Bangladesh.

Now, our program here is a very straightforward one, providing each child a morning meal of a cup of milk and a fortified biscuit. However, what we hear back from the children, their families, their teachers and our own people, is much, much more complex and highlights the importance of dealing with hunger.

We hear without exception that the nutritional program leads to increased attendance. It provides an incentive that makes kids want to go to school and makes their families want to send them. We also hear that the children have more energy and are quicker to learn. Their teachers tell us we're feeding their minds as well as their bodies.

And in some ways the most important thing we're doing by getting them to go to school – children, parents and teachers all tell us we're feeding their hopes and dreams. That's what feeding a hungry world is really all about. And Land O'Lakes is very proud to be part of that effort.

Land O'Lakes International Development Division addresses the issue of global hunger in other ways as well. We also deliver technical and economic development assistance that's helping modernize the food industry in needy regions, in turn building income levels, well-being, and quality of life for hundreds of thousands of families. At any given time, our International Development Division is involved in 25 to 30 projects worldwide. Their consistent focus is on how we can help resolve hunger issues by increasing agricultural productivity and boosting income.

Now, I bring all of this up here because I want to make it clear from the outset of my comments that what I have to say about our potential ability to address both food and fuel needs in no way diminishes the sense of urgency we should all feel when considering the issue of global hunger. We can't forget that today an estimated 830 million people are undernourished worldwide, a figure approximately equal to the estimates published as we entered this new millennium.

What that should tell us is that we have a lot of work left to do. And while the task of addressing global hunger is complex, involving social and economic issues, political and policy issues, transport issues, and now even energy issues, ultimately I'm convinced our success hinges on the discipline and targeted application of science and technology.

So today as I address the much narrower topic of food-versus-biofuel, it's within the larger context of the issues of addressing poverty and hunger on a global level and the recognition that this is just one of many challenges in the fight against hunger.

It's also with the belief that we must bring perspective and balance to our efforts. We must recognize that there are limits on the potential of biofuel. And one of the limiting factors is the impact on our ability to address global food issues.

All that said, during my formal remarks I'll focus on why I believe we can succeed in meeting this challenge and the important role U.S. agriculture and agribusiness must play in the effort. I'll recap the situation facing agriculture and agribusinesses, the challenge we face in meeting food and now biofuel needs. I'll outline the reasons I'm optimistic about our ability to meet those challenges, with a focus on the role that science and technology must play in positioning ourselves for success. And last, I'll comment on the absolute importance of addressing these issues in the very challenging arena of public opinion, where our best efforts could potentially be delayed or even derailed.

Let's start with a look at the situation today. It's both a challenging and promising time for agriculture and agribusiness. Global nutritional needs continue to grow. I've already talked about the challenge we face in terms of feeding a hungry world today. Tomorrow looks to be even more challenging.

World population continues to grow at about 200,000 per day, increased more than 7 percent between 2000 and 2006, and is expected to climb from about 6.6 billion people to more than 8 billion over the next 20 years.

According to a report from the National Academies, and I quote, "Feeding all of these people and eliminating hunger will require advances in food production and distribution that enhance food supplies without damaging the environment. Agricultural biotechnology is one tool that holds great promise for alleviating hunger and poverty."

At the same time we face this need to face a growing population, we continue to see new uses for agricultural production, competing with nutritional demands – like soybean-based inks, the use of canola oil in detergents, or the ongoing development of plant-based solvents, plastics and pharmaceuticals. These competing uses for food crops, however, pale in comparison to the potential impact of the demands being placed on agriculture by the new biofuels industry.

How significant is the impact of biofuels? Well, since we're here in Iowa, let's take a look at corn-based ethanol production. In the 2004-2005 crop year, U.S. ethanol production totaled 3.7 billion gallons, using about 11 percent of the U.S. corn crop. In 2006-2007, current projections estimate that figure will be about 6 billion gallons, nearly 20 percent of the U.S. corn crop. And by 2010 and 2011, it's likely to approach 10 billion gallons and 28 percent of the crop.

What we're seeing is both opportunity and challenge. We see a significant opportunity for agriculture to help drive progress in relation to global energy issues, while at the same time we face the ongoing challenge of addressing expanding food needs. I'm confident we are capable of making real progress in both areas, provided key players within agriculture and agribusiness embrace a rational, science-based approach to that issue. And there's ample evidence to support that contention.

U.S. corn production has increased from about 4.2 billion bushels in 1966 to more than 11 billion bushels in 2005 and a projected 13 billion-plus this year. And this is important. Analysts estimate most of that growth, more than 80 percent, can be traced to improved yields, rather than expanded acreage.

We're talking about the impact of things like improved genetics and traits, nutrient management, conservation tillage, integrated pest management, and precision agriculture. All of these advances have enabled us to deliver more value and feed more people per acre.

The success of U.S. agriculture and our ability to play a role in addressing world hunger has long been driven by the willingness of our producers to be innovators and early adopters of technology. From the development of the cotton gin in 1793 right up until today's advancing biotechnology, we've consistently developed and embraced safe, proven technology.

And the results have been impressive. These charts tell the story. U.S. corn yields have gone from 28 bushels per acre in 1900 to 38 bushels per acre in 1950 to more than 150 bushels per acre today. And in certain areas new biotech corn seed has delivered more than 200 bushels per acre this past planting season. Wheat yields went from 12 bushels per acre in 1900 to 16.5 in 1950 to close to 40 bushels this year.

And in an area close to Land O'Lakes' heart, per-cow milk production went from 4,500 pounds annually in 1930 to 7,000 pounds annually by 1960 to just under 20,000 pounds annually in 2006. And we've seen these same kinds of improvements in other crops as well.

While these yield improvements are impressive in and of themselves, what's more important is how they relate to our ability to alleviate hunger. In 1930 the average U.S. farmer fed ten people. In 1950 that figure was 27 people. By 2005 that number had reached 144 people. And today I expect it's meaningfully higher.

This productivity trend has also had an impact on prices, with the U.S. population spending the world's lowest percentage of disposable income on food. As you see here, over the past eight decades Americans have spent a decreasing portion of our paychecks on food. U.S. families spent an average of 23 percent of their disposable income on food in 1929, a figure that dropped to below 10 percent in 2005.

I believe we must continue to work at increasing yields and reducing the food bill as a percentage of income on a global basis. And we can do that best by continuing to aggressively apply information, insight, science and technology to this task, giving us a two-edged approach: more supply means lower prices; improved income means more to spend on food.

And this, of course, has done more than just drive productivity. It's also made agriculture more environmentally friendly and sustainable. Biotechnology, for example, not only has increased yields, it's also led to reduced pesticide use and enabled the substitution of more benign herbicides.

A 2004 report from the National Center for Food and Agricultural Policy calculated that, in the six main biotech crops, we saw an increase of yields by 5.3 billion pounds in 2003, while at the same time a decrease in pesticide use by 46 million pounds. A study released by the American Soybean Association in 2005, which relied on scientific data from a variety of sources, found that biotech crops increased net yields, cut pesticide use, enabled to switch to benign herbicides, enabled the expansion of conservation tillage, made U.S. commodity crops cheaper

for developing nations, and resulted in foodstuffs that were as safe as, and in some instances safer than, those produced with conventional agricultural methods.

The technology of precision agriculture also has shown the potential to increase yields, provide for more efficient equipment and energy use, and optimize environmental stewardship. Further, the higher yields that have come along with these advances have made it easier to keep marginal or sensitive lands out of production.

In his remarks when accepting the Congressional Gold Medal this July, Dr. Borlaug pointed out that, without the technology-driven increases in cereal grain yields which we've realized since 1950, we would have needed 1.2 billion additional hectares, which translates to about 3 billion acres, to match the year 2000's production. And in his own words: "If more fragile land would have been brought into agricultural production, the impact on soil erosion, loss of forest and grasslands, biodiversity and extinction of wildlife species would have been enormous and disastrous."

Now, my point here isn't to list every innovation that has benefited agriculture and society but rather to illustrate, as Dr. Borlaug knew when he launched the Green Revolution, that science and technology have a lot to offer us as we work to feed, and now help fuel, the world.

As I consider this challenge, I believe a three-pronged effort will enable us to simultaneously meet food and biofuels' demands. Here in the United States that effort must focus on:

1. Further development of genetics that increase yields, particularly in corn and soybeans, and at the same time add genetic value tailored to specific crop food, feed and fuel uses;
2. Improving the efficiency of the biofuels production process; and
3. Developing additional renewable energy sources – use of other crops, in particular non-food crops, as well as such sources as wind, solar, and waste.

Now, I'm using U.S. agriculture as my focal point because I honestly believe U.S. agriculture has the resource, the record of success, the will, and the obligation to lead the way in this effort. Let's take a deeper look at these three strategies.

First, the need to continue to focus on developing genetics and traits that improve yields and address specific food, feed and fuel needs. For the sake of example, again, since we're here in Iowa, let's look at corn.

As this chart shows, future corn production can meet food and fuel needs if we can maintain stable acreage and a four-bushel-per-acre-per-year yield improvement – a rate of increase consistent with history. What you're seeing here is that between 2005 and 2015 there is an increase in corn available for export, ethanol, food uses and for overall feed use when you combine feed grain and distillers' grains – this all driven by a continued growth in our historic yields.

Importantly, we can accelerate our progress towards meeting all these needs with the development of specific genetics that maximize food, feed or fuel value of each bushel. And that's what biotechnology has to offer – more volume and more value.

The same principle applies to enhancing the food, feed, and fuel value of other leading biotech crops. By putting science to work for us ultimately on a global basis, we can make real progress toward more effectively addressing global hunger while also meeting the demands of the biofuels industry.

Second, to be truly effective, we need to optimize the efficiency of the ethanol and biodiesel production process itself. Not only in terms of biofuel energy produced per bushel but also in terms of the volume of fossil fuel used in biofuel production. Current studies indicate that it takes one unit of fossil fuel energy to produce 1.3 units of corn-based ethanol energy, while one unit of fossil fuel energy is needed to produce 2.5 units of soy-based biodiesel energy.

We need to improve on that, and work is under way. For example, E3 BioFuels in Mead, Nebraska, is now fueling their ethanol plant with methane from two biodigesters being fed with cattle manure from a nearby feed lot. Essentially they're using biogas to make biofuel, using virtually no fossil fuel. Is that the answer? Well, I don't know. But it's the kind of science-based approach, creativity and can-do attitude we need as we approach this issue.

Third, we need to develop new sources of renewable energy. We need to recognize that corn, soybeans, and sugar cane are not the only potential sources of crop-based energy.

There was an interesting article on biofuels in this month's issue of *National Geographic* that looked at U.S. biofuels and noted that, even if we turned the entire corn and soybean crop into biofuels, they replace just 12 percent of our gasoline and 6 percent of our diesel. Clearly, we need to be pursuing other renewable energy sources.

That's why alfalfa is on the energy crop radar screen within Land O'Lakes' seed group. Alfalfa as an energy crop offers environmental and rotational benefits. It's a net contributor in terms of nitrogen and carbon in rotation, offering yield benefits to the following crop. It also offers soil erosion benefits, which row crops don't. And it offers some economic advantages with relatively low input costs and high-value leaf co-products.

Alfalfa makes sense as an energy crop from both energy generation and economic value point of view. That said, it will again take sound science to make it work – primarily, the development of alfalfa genetics that drive lower fermentation costs and higher ethanol yield.

We also need to look beyond traditional crops as energy sources. For example, at Land O'Lakes we're evaluating the potential of switchgrass and cornstalks in ethanol production. I do believe that, if we're serious about meeting food needs while also being part of the energy solution, we need to be very serious about developing technologies that will enable us to generate biofuels from stalks, leaves, and other plant byproducts as well as non-food crops like prairie grasses. And we need to proactively encourage, support, and lead policies and programs that move us toward that goal.

Further, we need to look outside the crop arena itself for new energy sources, like accelerated development of wind and solar or expanded production of energy from waste. To be truly effective in changing the economics of energy, ethanol and biodiesel must be part of a more ambitious and diverse offering of alternatives to traditional fossil fuels.

In review, as we look at U.S. agriculture and the biofoods-biofuels issue, I believe we must support policies and programs that promote the development of biotechnology, that improve the efficiency and environmental friendliness of our biofuels production process, and that promote the development of new sources of renewable fuel.

While we do all this, we must also remain focused on our goal of helping feed a hungry world. We must support policies and programs that enable us to better deliver nutrition where it's needed, enhance the ability of nutrition-deficit regions to expand their own production, and spur economic development that reduces poverty and increases the ability to pay for food.

While there are numerous challenges before us, I'm confident that, by consistently embracing a rational and science-based approach in our search for solutions, we can successfully address the food/fuels challenge.

We will, however, have to be ready to leverage the resources of those who support these efforts and be prepared to answer critics who would oppose our efforts. As I consider the situation here, this is in many ways as much a policy and public opinion issue as it is a production issue.

We absolutely must create a forum for reason, fact and science-based education and discussion of the issues surrounding biofoods and biofuels. This is especially challenging here at home where less than 2 percent of our population is involved in farming and rural residents are outnumbered by urban and suburban residents four to one.

This chart provides a picture of the increasing urban influence in our population. What does that mean? It means that it's easier for those who are not directly involved in agriculture to sway public opinion on agricultural issues; to leverage emotion, politics or other agendas rather than fact-based arguments; to shape public opinion regarding the safety, quality, health or environmental impact of new science. We can't let this deter us from our commitment to continue to aggressively drive innovation in our efforts to meet global food and fuel needs.

Now, this is not code for rushing to judgment or risking the use of unsafe, unhelpful or environmentally unfriendly science and technology. The fact is, our history shows that we have consistently been successful in the development of and application of technology that is safe in production agriculture.

Those of us in agriculture and agribusiness have an obligation to lead the debate and the discussion not just in our own community but in the broader public spectrum. We have the responsibility to build public support for the adoption of new, beneficial technology. We need to generate widespread understanding and acceptance of the role it can and must play in addressing food, feed and biofuels issues. That will be the key to our success or failure. And mistakes are just too high to even consider failure.

I firmly believe that if we let science work for us, we will succeed. And if you share that view, you're in good company.

Let me close with a quote from Dr. Borlaug's Congressional Gold Medal acceptance speech when he said, "The majority of agricultural scientists, myself included, anticipate great benefits from biotechnology in the coming decades to help meet our future needs for food, feed, fiber, and biofuels."

Optimism, from an expert.

Thank you.