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Biofuels and Biofoods: The Global Challenges of Emerging Technologies
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OPENING CEREMONY

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Speaker: **Hugh Grant**

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President, Chairman, & CEO – Monsanto Company

Thank you very much, Ambassador Quinn, for that kind introduction. You know, 1981 to 2007 is 26 years – I don't know if it's really meteoric, or more a steady pace. But I'm delighted to have the honor to be asked to begin the session today.

I'm really thrilled to be part of the grand house that Dr. Borlaug has built. And I don't think it's any coincidence when you look at Dr. Nelson and Dr. Borlaug just working on that theme of, you know, we're all connected – they both started on family farms. And I think when you look at the creativity and how they've applied that creativity to global issues, it's always connected back to the farm, and it's always practical. So I'm really pleased to be part of this.

Over the next two days this august group, the World Food Prize group, will have a rare, and I think it's a rare opportunity, to all be in one place together, to have the opportunity to look at the challenges around the conundrum of meeting the ever-growing demands of food and fuel. It's a time for listening, it's a time for discussion, it's a time for dialogue.

I don't know about you, but every time I open the newspaper – and it seems to be happening more and more – there's this conversation that demands in agriculture, that the demand lines continue to surge. And this is driven to a large extent by China. China looking for more calories, China looking for more protein. And increasingly, the Americas, from Canada all the way through the southern cone, the Americas are becoming the garden states that are trying to fulfill the increasing demand from China.

But it isn't just food, as the headlines here. It's not just food. It's food and fuel. So we've got a hungry world but increasingly a thirsty world that's looking for more fuel to drive trucks. Conventional wisdom, if there is such a thing, says that by 2030 – which is another meteoric rise – by 2030, the estimate is that energy demands will have doubled; they will have increased by that level. And I think, unless we apply every resource and become more stringent in conservation, we will face a crunch. We will face a crunch.

So therefore the incentives around continued research in the areas of biofuels, I think, are prudent. As I look at this, you know, there's this kind of dueling banjos thing at the moment on what crop is more appropriate. And I think it's way early to call this in terms of what crop is more important. If you look to Europe today, it's canola, it's oilseed rape. If you look to Asia it's

palm oil. If you look to Brazil, it's obviously sugarcane. And here in the domestic U.S. it's corn, but it's also soybean for biodiesel.

I wouldn't select any of these as my favorite children. I think that research in all of them is the right direction. There's a whole bunch of talk about switchgrass, and there's a whole lot of conversation about cellulose and alcohol from cellulose. I don't think we have it figured out yet. And my guess is, based on my researchers at Monsanto, it's probably five to ten years before we've got it figured out.

So I think we're going to be looking in this country at corn for a while to come. Its production costs are favorable, if you take the long view. Its environmental profile is still more favorable than petroleum. So I think in the near term corn is probably going to be there for a while.

So energy demands increase. If we were facing this problem pre-1996, I think it would be a real imponderable, because the technologies available really weren't there. I think it would have been almost an impossible task.

If you take a step back and you look at the golden years of the 1950s, there were but two and a half billion people on the planet, and there was 20 percent more land farmed. Two and a half billion people on the planet, 20 percent more land farmed. Today, there are two and a half billion more people and agricultural area is actually decreasing. And if you fast forward another 20 years, there will be another two billion citizens in this little world that we inhabit, and food demand will double.

So the squeeze is on. And I think the squeeze is: as a community involved in agriculture – how do we make more with less? How do we squeeze more food out of every little patch of soil? How do we optimize production in every gallon of water? Because water concern is growing as we look at food and fuel. There is a continued escalation between the pressure of cities and urban land competing with agricultural land. And that squeeze between the two is increasingly focused on water.

This year, for the first time – you heard it here in Des Moines – there will be more than half of the population worldwide living in urban and city areas. So the equation has flipped.

If you look at the U.S., it's a weird kind of democracy. 2 percent of the population farms; they consume 70 percent of the water. If you go to some of the developing countries, that 70 becomes 95. So it's clearly not sustainable.

For the next couple of minutes, let me just talk about some of these conundrums. I don't profess to have the solutions. That's the great thing of the keynote – you can set up some of the problems. If you look at agriculture and you look at today's agriculture, how do we increase yields? And how do we increase yields and reduce the environmental footprint?

Secondly, how do we build partnerships within rooms like this, especially as they apply to Africa, particularly as they look at sustainability in global agriculture?

There are two tools that look promising, based on 10 or 12 years of experience. One is molecular breeding, so improved breeding systems. And the second one is biotechnology. And I think they might be part of the answer as we look forward. We're already seeing yields increasing worldwide, and that's happening because we're compressing research cycles. And as we compress research cycles, we are also getting more insight into what makes plants tick.

If you look at the last 40 years, yields have increased in this country about 2 times over until now we're yielding about 150 bushels per acre in corn. And I apologize – I made the switch from tons per hectare to bushels per acre, and it's getting more and more difficult to go the other way. So 150 bushels in an acre roughly. And a few miles from here farmers are now regularly yielding 200 bushels per acre. There are many who believe that the opportunity to double this will take less than 40 years in the future. And the prediction is it will move from 200 to 300 bushels per acre well within the next 40 years.

But as we look at increasing yields, I think you have to face the fact that agriculture has been hard on the environment. It came with a price. As we look at today's agriculture, we're beginning to see the opportunity of increasing yield with a potential decrease on the impact on the environment.

The first decade – it's actually 12 years now – but the first decade of captured data suggests that there's about half a billion pounds of pesticides that have disappeared with the introduction of these new technologies. And with the increased use of no-till and minimum-tillage systems, and leaving the plow in the barn, we're seeing more carbon being tied up in the ground.

The elimination of fuel in spraying and plowing is yielding somewhere now in the region of 20 billion pounds of carbon sequestration, which is about the same as 4 million automobiles taken off the road for a year, which would be good news where I live.

So these technologies can do a lot, but there's a whole bunch more that we need to do, particularly around reducing water use. At Monsanto I think we have the beginnings of a partial solution. In the last five growing seasons, we've been testing drought-tolerant corn – corn that now is using less water and yielding about 10 percent more. And we anticipate that these will be commercialized early in the next decade right here in the U.S.

So it's the prospect of having plants that sip instead of gulp. In rain-fed agriculture around the world, these become important tools in the next ten years. But in rain-fed agriculture in Africa, they have the possibility of stabilizing yield. And when you stabilize yield, you generate surplus.

So as I think about this, as the technologies become more and more complex, the importance of relationships grows. And that may sound fluffy in a room like this that's filled with scientists. Whether you're hard scientists or social scientists, relationships might sound fluffy, especially when you've got a suit and a tie on on a stage. But the more complex this business becomes, and I think it will become more complex, the more important the cooperation, the linkages, and the trust become.

At Monsanto, in our commercial business today – because sometimes people say, “Yeah, you talk about fluffy stuff when you talk to NGOs, but you’re a big corporation” – at Monsanto our business is driven more and more by the importance of relationships. We announced this year a new venture, a new relationship with BASF, a German company. We’re working on eight big projects that focus on yield, that focus on drought stress, that focus on nitrogen utilization. The scientists knew each other. The scientists knew each other across the Atlantic. Today they’re learning to work with each other, and they’re learning to trust each other. And I’ve been watching this relationship slowly build. I believe that better relationships have the possibility to yield better products to meet farmers’ needs worldwide.

But when you look at sustainability – and everybody believes that they have a piece of the sustainability argument – sustainability goes beyond profit; it goes beyond quarterly profits. And as we look at this, I think there’s a piece of our mission to serve all our stakeholders worldwide beyond simply quarterly profits.

Dr. Borlaug finished a *Wall Street Journal* essay recently – I don’t know if you saw this – but he talked about pro-poor biotechnology and the need to develop pro-poor biotechnology, which others refer to, and it’s kind of jargon, but others refer to as the democratization of technology. I applaud and I agree with his sentiments. And I believe that Monsanto and companies like ours in this industry have a responsibility as we make these advancements in science to work more aggressively on how we share them worldwide and how we all want access to a broader global agricultural community beyond our traditional commercial customers.

So expanding partnerships with NGOs and moving technology to the poorest farmers is something that we have been looking at. If you look at the variety of partnerships that we have started with this “gene revolution,” as Norman calls it, in almost every region that we have seen this starting, we have seen yields increase. In India and China and Southeast Asia we’re seeing yields and quality improving every year.

The conundrum is that in that same timeframe Africa has gone backwards. It hasn’t even stood still; it has retreated. So why has that happened and what can be done about it?

We’ve done some work in Malawi, and I’d like to take a minute and look at that work in Malawi as an indication of what some of the answers might be. Many of you know that Malawi is one of 49 countries that the United Nations lists as least developed. Life expectancy is around 40 years. If you have two dollars in your pocket, you would be on the upper end of earnings per day. There are 12 million people in the country, and 80 percent of their caloric intake depends on corn, so corn is a big deal.

You know how I talked about 150 bushel as the average yield in the U.S. In Malawi it’s a really, really different story. Farmers are using biblical tools, which may be historically interesting to some, but from a technological leverage point of view, it’s atrocious. They’re yielding a fraction of the U.S. Yields have increased to a national average now of 32 bushels per acre in corn, so about a fifth of the U.S.

Women till, women plant, and women manage the farm. And the farm is a little bit smaller than a Midwest yard, probably a lot smaller than a Des Moines yard, from what I saw yesterday. They're almost always the last to eat.

In 2004 there was a drought. There's a drought every eight years. 2004 was a drought. Food aid poured in. Monsanto donated a million dollars – it was the first time we'd done something with this – and grain was delivered. A ton of grain delivered to a Malawian village cost in 2004 \$400 a ton, end to end. A ton of grain feeds a family of six for a year. And a million dollars feeds 16,000 family members for a year. I'm in business; we kind of love numbers, you know?

It worked, but it isn't sustainable. And the team that led this at Monsanto sat down and in 2005 we talked to the Malawian government, we talked to the Millennium Village Project, we talked to UNDP. We got our heads together, and in 2005 we donated seed, and we sent 700 metric tons of corn seed to Malawi – not biotech, regular hybrid corn that's been used in this country since the 1940s. When you take that corn and you add a splash of fertilizer, the amount of seed that you need to grow a ton of grain in-country costs about \$40 – \$400 versus \$40.

We worked on the fertilization; we did a lot of training through the Millennium Village and the UNDP programs; and we got lucky with weather, and that always helps in farming. Yields increased 5 to 10 times in the farmers that were using it. Cash was generated through the surplus, and by our estimate, 140,000 farmers and family members were fed – \$40 versus \$400, and 16,000 people versus 140,000.

It was the first time in years that some of these farmers had broke out of subsistence farming. For me it was a lesson on working together. It was a lesson on sharing.

And there was another big change that I saw when I went. Instead of waiting on the grain harvest coming out of the back of a truck, there was a dignity in growing your own harvest in your own village.

We've committed to five years in this program with the Millennium Village, and we enjoy working with them and with UNDP. They're linking new seed with local knowledge and local applications, and we can't do that.

We have also shared non-core crops like cassava and sweet potato and virus-resistant. And the skeptics – and I've met one or two – the skeptics would say, "That's easy for you, because those are non-profit crops. You make it look like a big deal, but it means nothing to you." But corn does, and corn is the heart of it in many of these villages. It's a major food staple, but it's a big commercial crop.

I don't have all the answers, but I think it's an area that's ripe for creative thinking and smart people. And I think there is an opportunity for new partnership models. We're spending \$2.5 million on R&D every day in agriculture with a ten-year horizon. And we are looking for a profit in that. We're looking for a return on that investment.

But there's a social responsibility that goes with this, and there's a societal impact, and companies like mine can't do that on their own. I believe that corporations, research institutes, governments, and NGOs and foundations getting their heads together have the opportunity to build better partnership models. And these partnerships, if they take root, have the opportunity to improve lives.

These speeches that talk of Africa always use the urgency word. It's kind of worn out. But there is urgency in this because there are 200 million citizens there who are malnourished. I think we – and it's the collective "we" in this room, it's this kind of concentration of brainpower – have another level of urgency, because commodity prices are increasing. And as commodity prices increase, food aid becomes more and more challenged. So the status quo becomes less sustainable.

The tools exist today that drive yields in food and fuel. There's biotech, and many of the developing countries are beginning to see that benefit. For those reasons, I hope that in Africa we can start to build the regulatory framework that allows the field trials to take place so that a seed can be planted and scientific evaluation can begin. Until that step is made, Africa will fall further behind.

The funny thing is, in closing – it's not as if African farmers don't realize this. Farmers are smart people everywhere in the world. There was a meeting earlier this year in South Africa, and it was the usual pros and cons of biotech, an educated debate. Halfway through there was a little guy, a little farmer stands up, with a sun-battered face. And he says to the woman on stage, "Do you have a refrigerator?" She says, "Yeah, I do." He says, "How long have you had that refrigerator?" She says, "There's been a fridge in our house ever since I can remember." He says, "You know, I want a refrigerator, too."

So it's not just about filling bellies. It's way, way beyond that. I think it's the question of – Why do you have one, and I don't? I think that's where this guy stood. Because he believed, and I agree, they have the right to choose. They should have the freedom to choose.

And I think my question for you is: How we can ensure that they at least have the freedom to choose? And I think we all have roles to play in that. As an agricultural company, today we have technologies that could make a difference. And perhaps more importantly tomorrow we will have more of these technologies – in drought tolerance and nitrogen utilization – that could start to move from subsistence to a sustainable ag model.

We cannot do this on our own. The NGOs have local knowledge, local contact, local connections that can connect best practices with needy farmers. And governments need to step up in infrastructure and look at policies that support agriculture in Africa.

I'd ask you to imagine. I'd ask you to dream for a little bit – and it's early enough in the morning to dream. I'd ask you to dream for a little bit about a Malawian proverb that says: *One head doesn't carry the roof*. I kind of like that one. It sounds kind of Scottish to me. *One head doesn't carry the roof*. And I think what this means is it takes a lot of heads, it takes many heads to make progress.

Imagine what we could do as a World Food Prize community if we could work together, if we left our baggage at the door. You know, “Monsanto is starting the keynote – you know how this is going to be.” Because I think skepticism is a corrosive commodity, and it’s an expensive commodity that Africa can’t afford.

I’d ask you to imagine a day when a sub-Saharan African farmer can choose to plant a drought-tolerant corn or a seed that yields more on his little patch of land, but do it in four or five or six seasons from now at the same time when an Iowan farmer is doing it, rather than 15 years later, which is the model we have today.

Imagine having relationships amongst ourselves in rooms like this that we could engage in that discussion and do it sooner rather than later. I think we need to work together, and we need to do this more often and more effectively. And I believe that these relationships – that fluffy stuff – are the keys linked to the technology to drive this discussion forward. And working together, I believe that we can and we will do much more than if we go alone in agriculture.

Thank you very much for your attention.

Ambassador Kenneth Quinn
President - World Food Prize Foundation

That was wonderful. Thank you very much, Mr. Grant. This was a wonderful and inspiring talk to begin our symposium. And, see, we'd only met yesterday, but I think you see that my insight was about his passion for Africa and his focus on agriculture that really came through and demonstrated again by your remarks today.

I'm so pleased that you could be with us, so pleased that your family could be here with us as well. I know you've got a busy schedule, but you've got us launched. Thank you very, very much. And we're so grateful to you, Monsanto, for the wonderful support you provide for us. And we'd just like to have you back again and again. You've been here, and we consider you part of the World Food Prize family. Thank you again. Join with me in thanking Mr. Grant.