Sabina Xhosa and the New Shoes
Introducing New Technologies in Developing Countries

Thank you for the kind introduction, President Lamkin, and thanks to all of you for turning out this evening. I'm very honored that you decided to be here for an evening lecture particularly after dinner. And I'm looking forward to having a discussion with you after my remarks.

It's my first visit to Westminster and it's a flying visit. But I'm very impressed based on what I've seen and feedback from the international business class I spoke with earlier.

The Monsanto and Westminster College relationship obviously began with Dick Mahoney, our former CEO, and his support for the Churchill Library and Museum. And I understand on a similar evening a few years ago you had John Bachmann of Edward Jones here, and he's a member of Monsanto's Board of Directors. So I am very pleased to continue that tradition, and I hope it continues to build our relationship.

It struck me when I was invited that the expectation might be for me to include five or six notable Churchill quotes, as there have been in many previous of these lectures. I can tell you there are no Churchill quotes tonight. So that wager is safe. The only reference that I'll make, and it's a passing reference, is to some of the challenges that were being faced when he gave his famous speech parallel some of the challenges that exist in developing countries today. And that's it for references to Winston Churchill.

I'm going to talk about technology and an introduction of technology into developing markets. I'm going to focus on agriculture. I'm going to focus particularly in Africa and particularly Sub-Saharan Africa.

When we talk about agriculture, we talk about production, it's on a finite base, it's on a base that's very fragile, and it's a base that depends on a very, very large extent on water and how you manage water. So it's amazing that so much depends on so little.

Sixty years ago the big challenge was the partition between Communism and non-Communism and free markets, and it took 45 years to resolve that. Some would argue it still isn't resolved, but 45 years later, the Wall came down and the world changed. What we face today is a challenge of similar complexity and of larger magnitude, and it's one that we
don't have 45 years to figure out. It's a very, very safe bet we don't have 45 years to figure this one out.

It's an insidious challenge and, in many parts of world, it's an invisible challenge. It's out of sight and out of mind. It's a challenge of food and a challenge of water, and they are linked. Food production depends on soil and soil depends on water availability, so I'll talk a little bit about both of them.

Seventy percent of the fresh water on the planet is consumed by agriculture. That's 70 percent. So if you think about the U.S., two to three percent of the population - that's how many work directly in agriculture - consume 70 percent of the water in the country. It's a bizarre kind of democracy. And in many other places, it's even more extreme than that. So, the supply of soil is finite. The supply of fresh water is finite. When you combine the two, you get one really big challenge.

Water supply is additionally challenged because of the shifts in climate that we're beginning to have. It's a challenge globally, so whether you're farming five miles from here or you're farming in Iowa or you're farming in India, the utilization of water is a challenge globally.

But nowhere is that challenge more obvious, and nowhere is that challenge greater, than in Sub-Saharan Africa. So if you're growing cotton outside Los Angeles, you're bringing water all the way across the desert. But there's an infrastructure there that permits that to happen. In Sub-Saharan Africa, the absence of that infrastructure makes the challenge even greater. If you're farming in Missouri and you have a dry year like last year, then the banks get really angry and might even come in and take a piece of your farm, but that's as bad as it's going to get. For a small holder farmer in many parts of the world, if you have a really dry year, it's catastrophic. It's the end.

And in a country like Malawi, that happens. It happens a lot. It happened in 2004. So I'd like to discuss what happened in Malawi as a model of what could and should be done in the future.

Malawi is an inland nation, about the size of Pennsylvania and with a population of about 12 million people. The country experiences drought conditions about every eight years, sometimes more, sometimes less, but about every eight years there's a catastrophic drought. And with the drought there comes a squeeze on agricultural production. Seventy-two percent of the people's caloric intake depends on maize, or corn, so you can imagine in a dry year how that shapes out. To a large extent it's an agricultural country; agriculture's the primary industry.

But it's a different kind of farming than what you may be familiar with here in the U.S. In Malawi, as in many small holder systems around the world, a farm would be about the same size as many of your backyards. Here in Fulton the backyards are probably bigger than a
Malawi farm. So very small farm sizes, and that's why they're called small holders. Every year they till the soil with handheld equipment. They weed with handheld hoes, and the equipment is medieval. So this is the mother and father of organic farming. It hasn't changed in a long, long time. And the seed that you use is very old and substandard in the majority of cases, so it's no surprise in that kind of system that farmers are producing about a tenth of what they produce here in the Midwest.

The other big difference isn't unique to Malawi. I've seen it in many places around the world. Farmers are largely women, so the woman of the family is tilling the fields. She's planting seed. She's fertilizing the crop. She's the one that's praying for rain. She's the leader and farm planner at times of harvest, and she's the last one in the family to eat. So the hierarchy in the family generally is feed the children, feed the husband, feed the chickens if there are any, and then feed yourself. So she plans the complete operations of the farm and she's the last one at the cooking pot.

In 2004, severe drought conditions in the country really, really impacted agriculture. And a lot of aid flowed in from around the world. Monsanto donated a million dollars to the World Food Program, which does a lot of work to make sure that food is available during crisis events. A ton of corn, harvested down the street here and delivered to a village in Malawi, costs about $400 end to end, from taking it off the farm to delivering it to the villages, $400. That ton of corn feeds a family of six for a year. So $400, corn, train, ship, truck, village, feeds a family of six for a year and costs $400 bucks.

We got involved. Critics will say we're a greedy company and we always make a profit so what's our angle here? We got involved because we're an agricultural company. That's all we do. We used to do other stuff. We only do agriculture today. But within agriculture, more and more, we only do seed. So a bunch of people at Monsanto got together and said that there has to be a smarter way around this because, you know, the funny thing is companies are made up of people. So some of our people got together and said what's the best way of doing this, and the only thing that we do is agriculture, and the only thing we provide is seed.

In the last 10 years, we've seen success with seed in many other parts of the world. So the innovations that we've introduced in the Americas, North and South America, Brazil, Argentina, Australia and many parts of Asia, and now more recently in Europe, we've seen some significant success in the leverage that seed has on improving production. This isn't biotechnology; this is regular seed, and it makes a huge difference for farmers.

When you look at the agricultural productivity around the world - countries like India, China, and those in Southeast Asia - every year their productivity improves. So it's not absolutely linear, those peaks and troughs, but the trend line is very healthy. India is going to be just fine.
Africa is completely different. Africa, in that same time period as other countries, has gone backwards. The productivity has reversed, and their efficiency has reversed. So there was a lot of conversation within Monsanto about how there must be another way of doing this.

In the meantime, the food aid that was sent did the job. It addressed the immediate need in Malawi. But it isn't a sustainable solution. So once we get through 2004, we ended up having a discussion with relief organizations, non-government organizations, the Malawi government, and some of the relief agencies, particularly an agency called World Vision. We got together and said this is going to keep on happening unless we take a different approach. And that's what we did.

Based on our 2004 experience, in 2005 we knew the need - high quality seed - and we donated enough seed to make a difference in one year. And that seed was linked with some of the NGOs and the government and relief agencies working on delivery and distribution systems to get the seed from the port to the fields. This was regular seed, not biotech seed. It was U.S. seed. Seed doesn't care where it grows as long as it's on the same latitude around the world, so we found seed that we thought would work in Malawi, and we did a bunch of education with farmers. It was about 700 metric tons of seed, and the equivalent cost was $840,000. When you add that to some fertilizer, and this is the leverage in economics, that same family of six in a village in Malawi can grow a ton of seed, can grow a ton of maize with $40 dollars worth of seed. So $400 to move it from Iowa to Malawi, versus $40 to send the seed and the fertilizer to produce the same harvest. The result - and we're pulling the results now - the result was huge. We saw yield improvements going from about half a metric ton per hectare to five - a 10X improvement in one year with clean seed with fertilizer and education. So it's a very different economic model. Some farmers said it was the largest harvest they had seen in their lifetimes. That's the difference between self-sufficiency and welfare, between doing something for yourself and waiting on the world to help.

Another outcome, and it's obvious, isn't economic. It's the dignity that comes when you actually have your own seed and you can manage your own destiny rather than waiting on that relief truck to come to the village. So for us at Monsanto, there were three lessons.

The three lessons were, first, self-sufficiency's far more efficient than the food aid. It doesn't make food aid bad, but self-sufficiency is a much more attractive option because it's sustainable in the long run.

Second, partnerships, networks, and relationships are key. An American corporation doesn't have all the answers. A government organization doesn't have all the answers. The NGOs have plans but often don't have the muscle behind them. So the linkage of these things creating a new model is really easy to talk about; it's really tricky to do, but partnerships and most relationships and networks are really key.
And third, and I've seen this personally in a number of other countries, is that farmers in developing countries will embrace new technologies if they're available. Farmers are very, very resourceful. And when it's women managing that farm enterprise, they're looking for help because they see and want those benefits. They can enumerate the benefits very quickly.

So I think as you look at this, you can get partial agreement on the first issue. Self-sufficiency is a no-brainer. Everybody agrees that self-sufficiency makes more sense.

For the second lesson - partnerships and relationships - you get general understanding. You say to somebody, "What do you think of partnerships? That's a good thing, right?" When you actually engage in that partnership, there's a gestation period, so what's in it for you, what's in it for me, why are we doing this, what's the angle? Some have said that we're migrating from a society of trust-me to a society of show-me, and in a trust-me environment, I know best, do what I tell you, things are going to be fine. The show-me one is let me see the data, let me understand what's in this. In partnerships, particularly in these multifunctional, private-public relationships, the show-me approach is the only one that will really work.

The third lesson - farmers want new technologies - is more difficult to crack, but it's imperative if we're going to get this done faster than 45 years. There's a little less agreement on the benefits of new technologies between those who support them and a piece of society that says "leave things the way they are, it's always worked like that." Nonetheless, a clean hybrid seed has been used in the United States for 50 years makes a huge difference in Malawi. With the advent of biotechnology in the past seven to 10 years, you can see the difference in Brazil and Argentina, in the U.S., you see it happening in India in the last three years in cotton, and now in Europe in the last spring.

I don't think there's any rationale that says these are technologies that should not be accessed by African growers, usually small African growers. I am mystified at any rationale that would deny desperately needed technology to the African farmer - the same technology that has been used successfully and safely for more than 10 years by the American farmer, and the Canadian farmer, and the Brazilian farmer, and the Australian farmer, and the Indian farmer, and - surprisingly but increasingly - the European farmer.

We've seen progress in South Africa. In fact, in South Africa, one of our customers is a woman who farms 12 acres of corn - and that's a big spread. South Africa embraced biotechnology pretty early on, and she grows corn that's grown here in the U.S. It's insect-protected corn, so instead of spraying insecticides for bugs, a gene in the corn protects it from corn worm. It's a cousin to the corn worm that we have here in the Midwest.

The name of our customer is Sabina Xhosa. Sabina made enough money off of 12 acres of corn by using biotech that in conversations with our sales manager, our district sales
manager in South Africa, she presented or showed him a shoe box. She was immensely proud of the shoe box and when she opened it up, it had shoes in it, unworn, the first new shoes that she had ever bought. Her first pair of new shoes.

So there's an economic differential in this that goes beyond feed me, feed my family, feed my chickens ... where you start to deliver a cash crop that you can market. We're a long, long way from that in the rest of Africa.

Look beyond food to water - and remember that 70 percent of the planet's water is consumed by agriculture. In the U.S. today, we're three years into field testing. We've done about 55 trials on drought-tolerance in corn. The results are remarkable. We have corn crops that are sipping water and yielding more so they consume less water and generate more yield.

I can say with a high degree of certainty that this is a technology that will be launched in Missouri, and in the U.S., in the 2010 to 2012 time period.

I can say with absolute certainty that if something doesn't change, that drought-resistant corn will not be launched in Africa, with the exception of South Africa, for the next 10, 15, or 20 years. This is absolute certainty. And the result of that will be that old model of $400 a ton for donated grain instead of the corn grown by farmers themselves.

The African farmer deserves more than that. It isn't benevolence. It isn't altruism. For a commercial enterprise in the next 30 to 40 years, the conversation that says you're going to have to wait, this is an advanced technology, you're not quite ready for it - the societal impact of that is going to be untenable. We've seen some of it today with the pharmaceutical industry and AIDS treatments. It's going to be untenable for food production, and it's going to be even worse for water.

In 1996, we launched biotech cotton in the Mississippi Delta. This year will be the 11th harvest. They used to spray cotton 10 or 11 times with helicopters and fixed-wing aircraft. The sprays in cotton have been reduced now to two; they've gone from 10 to two. Three hundred million pounds of pesticides have disappeared and it's nearly all gone.

We hope in 2008 or '09 to launch the first biotech cotton in Burkina Faso. So the traditional development model is you launch a new product commercially in the First World, and 10 to 20 years later you run the same technology through emerging economies. I don't think it needs to be like that, but at the moment we're struggling to get field trials established.

We've seen that happen in India. We've seen it happen in Southeast Asia. We haven't broken through in Africa in any of the Sub-Sahara African countries. So what do we need? We need one African country to say yes. One African country to start field trials. We need to
start the field trials and start testing this in African soil, and at Monsanto we're ready to work with an array of partners to make happen.

So the call to action in this is how do you overcome the traditional and obvious obstacles? The obvious obstacles in this are mainly physical infrastructure issues. It's roads. It's ports. It's the corruption. It's moving stuff through the channels, and it's the development of sound, legal regulatory systems, the regulated architecture that would oversee these operations. And that's the first step. They're really difficult challenges, but they are things that can be addressed, the things that we should be working on in Africa.

Remember Magic Johnson? In 1991, Johnson announced he had AIDS. He started an intense drug regimen, and he's still alive today. He's still around. And yet the cocktails that he started with in 1991, those treatments are still largely unavailable in many parts of Africa more than 15 years later. When we launch these new technologies in agriculture down the road in 2012, my hope is to make sure that we can do it in parallel in both developed and developing economies. If we can't, then this will be another Magic Johnson story.

So what does that look like? How does that work? What's the nuts and bolts that make that happen? As Dick Mahoney used to say, when does the strategy degenerate into real work?

Here's kind of how I think it needs to look. You get private companies like Monsanto that do what they do best. They bring innovation to the mix. So they're bringing science and the technology to finding the right kinds of seed that work in that environment.

Second, you get the NGOs rallied to focus on this and you start to eliminate some of the inter-NGO competition, because everybody believes that this is a worthwhile cause, but there's an enormous amount of squabble amongst these non-governmental organizations. The NGOs have to achieve a common purpose.

Third, we look to the private foundations. There's an enormous amount of capital there. We get the private foundations working on funding programs on how you capitalize this. We're seeing some of this start now with the Gates Foundation.

Fourth, governments have to do the hard work of building regulatory infrastructure, either copying Europe or copying the U.S. or building their own. But they have to define the rules of the road. And that has to be done in Africa by Africans.

And fifth, you get farmers working focused on what works in their farms and their soils and you involve them in the early stage in the trial programs. That's what happens in Missouri. Farmers need to be there at the start rather than being the recipients at the end.
If that happens, and I don't think it's a utopian dream, but if that happens, all of us would learn a lot better what the real issues are and how do we work with each other.

So for you tonight, what's the call to action? And how does this tie into you here at Westminster? I'd ask for your help in this program. I'd ask for you to get involved. You have a big international community here. And it's something that you should be involved in because what we fail to do, you're going to end up having to clean up anyway because this is going to be multi-generational. I don't think it needs to take 45 years like the wall did to come down, but this is something that you will inherit, and as the leading economies continue to grow and as Africa continues to regress, this will be magnifying more and more.

So I would ask you, whether you eventually work in business, whether you work in government, whether you eventually work in some of these foundations in the educational sector or in the public interest groups, I would ask you to take a vested interest and get involved in these programs. I absolutely hope you will do that, because if drought comes every eight years to Malawi, then we're responsible for every child who dies because of an absence of water or shortage of food.

So I'll finish with a story. In January of this year, I was in India. I took part in a farmer meeting in the middle of a field on a windy day in a big, big tent, and everybody was sitting on rugs on the floor, and we talked about cotton with 200 to 250 small farmers. We talked about production. We talked about their problems, and then at the end we had a chance to talk individually to a lot of them. Imagine this: you've got a Scotsman working for an American company, talking to 200 farmers in the middle of a field in southern India. The key in this is, and it goes back to Sabina Xhosa with her new shoes in South Africa, is that no matter how big your farm is, you should have access to technology.

And the conversation with a lot of these farmers in India was, what's next? When's drought tolerance coming? That absolutely blew me away. When's drought tolerance coming because we need that in cotton? And here's the kicker - that's the same question I'm hearing in Brazil. That's the same question I hear in the U.S. when you hold farmer meetings in Missouri. I guarantee you it's going to be the same question we get in southern Europe in the next couple of years as well.

And that should be the same question we get in Africa. And the answer for all of them, the answer in Brazil, the answer in the U.S., and the answer in Africa, should be the same answer. The technology should be arriving in those markets at roughly the same time because the 20-year delay of technology access isn't a sustainable answer for commercial enterprises or for us as a community of people.

I would ask you as you think about your remaining years here how you get involved with this program in Africa because Africa deserves nothing less.