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Chair

Mr. Larry Miller

Standing Committee on Agriculture and Agri-Food

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● (0900)

[*English*]

The Chair (Mr. Larry Miller (Bruce—Grey—Owen Sound, CPC)): We'll call our meeting to order.

I hate to rush anybody, but the chair always takes the heat if we start late, so we're going to start on time.

It's great to be here in Guelph, and thanks to our host, Member of Parliament Frank Valeriote, for having us here, and thank you, gentlemen, for being here.

Our first meeting format this morning is an hour and a half. Each group, organization, or individual is allowed 10 minutes or less to present, and then we'll open it up to questions.

First of all, we have, from the University of Guelph, Mr. Michael Emes, dean of the College of Biological Science.

Dr. Michael J. Emes (Dean, College of Biological Science, University of Guelph): Thank you very much, Mr. Chairman.

I'd like to begin by offering some explanation of my background. You'll recognize from the accent that I'm not a native son of Canada, although I'm working on it. I'm a scientist whose research is focused on improving crop productivity. I moved from the U.K. to Canada in 2002 to take up my present post as dean of the College of Biological Science at the University of Guelph.

It's the role of scientists like myself not only to develop the opportunities for improving food security and the quality of life for ourselves and others, but to do so in a way that is sustainable. I would hope, therefore, that you would regard me as someone who is trying to assess the facts from an objective standpoint, with no political or financial axe to grind. I should add that I have no funding from biotech companies.

As you know, from where I am, the reaction in Europe to GM technology has been much more negative than in North America, and its commercial and agricultural use as applied to crops has been extremely limited. By contrast, GM crops are widely grown in the U. S. and Canada.

I thought it might be useful to offer as part of my presentation my views on why it is the reaction to GM crops has been so different, particularly in the U.K., from where much of the negative reaction emanated early on. While there during the 1990s and early 2000s, I took part in many public debates and discussions and have some first-hand experience of the nature of the debate.

In my view, the heated debate about the acceptance of GMOs in Europe has been largely that. It created a lot of heat but very little light, largely because of the way in which issues were portrayed in the media and by the various protagonists. The use of emotive terms such as “Frankenstein foods” conjures up images that are themselves based in the world of fantasy. The attempt to reduce complex issues to a 30-second sound bite or a one-line quotation in a newspaper article does no service to either side of the argument on what is already, on a global scale, a widespread phenomenon.

Almost all of the global biotech crop area derives from soya beans, corn, cotton, and canola, which in 2008 approximately accounted for 115 million hectares. Biotech traits accounted for 37% of all the global plantings of those crops. GMs have been adopted by the U.S.A., Canada, China, South Africa, and much of South America, including Brazil, so the European position seems to be out of step and has also presented trade barriers, which arguably could affect Canadian farmers as well as those in developing countries who depend on exports to Europe.

Why is it that Europe became so suddenly opposed to this technology? One reason, I believe, is that it actually became an issue after the BSE debacle in the U.K., and the general public was highly sensitized to what they perceived as the failure of agriculture. In fact, at the time when it became a major issue in the late 1990s, GM products were already on the shelves of U.K. supermarkets and had been for a couple of years, but subsequently had to be withdrawn. There was then one scientific paper, which has never been validated, which produced a health scare. Prince Charles got involved, and the rest, as they say, is history.

What do we mean by genetic modification? This is about changing the genetic makeup of organisms, particularly in crop plants but also in livestock. This is, in fact, what breeders in agriculture have been doing for decades, if not longer, including, I might add, exchanging genetic information between species that do not hybridize or cross-pollinate in the natural environment. I'm not talking about GM technology at that point.

Agriculture, by definition, is not natural. The global population relies for its daily food primarily on only 15 plant and 7 animal species. Whether you believe that is a good thing or not, it is a fact. In the last 50 to 60 years, thousands of genes have been transferred into crops from species with which they are not compatible in the wild, most of which genes we know nothing about. Let me emphasize again: I am not describing GM technologies here. Triticale, which is the forage grown in Europe, is a good example of this. It's a cross between wheat and rye.

Therefore, if you take a fundamentalist view that moving genes across natural selection barriers is unacceptable, you should be aware that much of what we already eat has arrived on our plates by exactly that route because of the way these previous and still used methods work. The transfer of the desirable handful of genes that might, for example, confer resistance to a crop disease is often accompanied by the uncontrolled transfer of perhaps even 1,000 genes about which we know nothing.

● (0905)

Yet this relatively uncontrolled process has helped ensure a supply of nutritious food that most of us now take for granted. But rest assured, it has been a relatively haphazard, uncontrolled method of genetic modification, which has also included the use of potent mutagens and teratogens, which cause birth defects, in order to increase the number of chromosomes and produce desirable mutations.

Now, you can imagine that the media and press could have a feeding frenzy on the words I've just used. Just imagine the headlines: “Genes Cross Species Barriers”; “Teratogens Used In Crop Production: 'It's unnatural,' says boffin.”

Taken out of context, I have to tell you that all those things are true. Golden Promise, for example, is a widely grown cultivar of barley that is also grown by organic farmers. In fact, it's a mutant that was produced through irradiating barley with x-rays, causing all sorts of chromosome rearrangements—in fact, to get desirable properties for the whisky-making industry.

The point I'm trying to stress is that plant breeding of food production has always involved genetic modification and exchange of genetic information, and a lot of it has involved unnatural methods, even prior to GM. But headlines like the ones I've just made up could have put a stop to the last 60 years of progress before it had even started. My contention is that much of the debate has been distorted by sensationalist headlines that do no good to either side of the argument.

Neither is GM a panacea to solve the problems of food security and global hunger, but it is, I contend, another powerful tool in the armoury. Recently, Sir John Beddington, the U.K. government's chief scientific officer, wrote:

> There will be no silver bullet, but it is very hard to see how it would be remotely sensible to justify not using technologies such as GM.... No single approach would guarantee food security.

So what do we mean by GM in the context of the current use of the term? It involves the transfer of either a single gene or a chosen small number of genes from one species to another, or the modification of a gene that already exists within the plant. In terms of the technology—that is, the way we can achieve the particular genetic modification—the major difference between GM technology and what I discussed earlier is that GM is arguably more precise. It is, for instance, the incorporation of a single known gene into a background of, say, 30,000 genes and is traceable. Contrast this with what I described a few moments ago, whereby thousands of unknown extra genes may be incorporated as well as the ones you want.

So what can you do with GM technology, and what is likely to be the impact of such changes on the food chain and environment? Well, the examples I'm sure we all know most about involve putting in single genes that confer either herbicide tolerance or pest resistance. These are usually derived from micro-organisms.

The most important factors that can devastate crop yields are weeds, pathogens, and insect pests. How do we control these? Well, the bulk of what we've done is spray and pray, using masses of herbicides, fungicides, and pesticides, about which people understandably have reservations. The pro-GM lobby claims that they're better for the environment because they'll reduce chemical inputs; the anti-GM lobby says they will be worse. So what's the evidence? Well, the answer is, unfortunately, that both sides tend to use and misuse data accordingly. But what is indisputable, as an example, is that the use of GM cotton in Australia saved the cotton industry, which was on the verge of being eradicated because of the use of large amounts of pesticide. Similarly, in Canada there have been reductions on GM maize of about two-thirds of pesticide use. Dr. Van Acker will be able to talk more knowledgeably about herbicide tolerance.

Europe has started to change. There are now GM potatoes, which will be grown in Germany, Sweden, and the Czech Republic, and GM maize, which is grown in Spain and Portugal with the approval of the EU. Ireland has just approved GM maize in foods and feedstocks, and perhaps most significant of all, this week the EU Standing Committee on the Food Chain and Animal Health, with the backing of governments, including that of the U.K., has voted in favour of import of animal feed containing unauthorized traces of GM crops. So the regulatory landscape is changing in Europe. I have little doubt that more will follow.

Jonathan Swift—and I hesitated before introducing this quote, but I will finish on it—wrote in *Gulliver's Travels* that if a man can make “two blades of grass to grow...where only one grew before”, he will have done more for mankind, and I hesitate here, “than the whole race of politicians put together”.

● (0910)

That is an interesting challenge for all of us in this room.

The Chair: Thank you very much. That's a good quote to finish on.

Now I'll move to Mr. Rene Van Acker, also from the University of Guelph, from the Department of Plant Agriculture.

You have 10 minutes or less, please.

Dr. Rene Van Acker (Professor and Associate Dean, Department of Plant Agriculture, University of Guelph): Thank you very much.

My name is Rene Van Acker. I'm a professor in the Department of Plant Agriculture and associate dean of the Ontario Agricultural College at the University of Guelph, Canada. I thank the committee for the opportunity. I was also previously a professor of weed science and crop management, from 1996 to 2006, at the University of Manitoba in Winnipeg. My research areas include weed seedling biology and ecology, robust cropping systems, coexistence of genetically modified and non-GM crops, and trait movement from crop to crop.

My trait movement work has led to international collaborations, presentations, and consulting work in Denmark, Germany, Austria, Australia, Switzerland, and the United States, including membership on the scientific advisory committee for the international conferences on the coexistence of GM and non-GM crops in the agricultural supply chain, which has hosted conferences in Denmark, France, Spain, and Australia.

I grew up on a farm in southwestern Ontario. I hold B.Sc. and M. Sc. degrees in crop science and weed management from the University of Guelph and a Ph.D. in crop-weed ecology from the University of Reading in the U.K.

I thank you for the opportunity to present. My presentation is intended to draw attention to the challenges that may exist in trying to ensure that one type of crop does not contaminate another type of crop, and in particular how challenging this is in the context of preventing novel traits from appearing in crops in which they are not intended or wanted, especially when the threshold of presence that can cause harm is very low. If there is a regulatory consideration of potential harm due to the unintended presence of a given trait, it has to be realistic in that regard.

Most risks related to the release of crops with novel traits are related to novel trait movement, both from crop to wild type, for weeds, and from crop to crop. This is especially true for the movement of traits within and among farming systems and agricultural supply chains.

The issue of containing novel traits and/or transgenes and making sure they do not show up where they are not intended or wanted is a key point in debates about the desirability of certain novel traits. Coexistence is typically discussed in the context of accepted threshold levels of adventitious presence, but it is important to recognize that traits that are regulated must be fully contained to prevent escape and that the threshold for the presence of regulated traits is zero. This is the policy in Canada, as it is in the United States, Australia, Japan, Korea, and all EU countries currently.

In North America we have well over a decade of experience of commercial production of GM crops that contain distinct and easily traceable novel traits, and this experience provides us a wealth of examples and evidence that bear on the consideration of trait containment.

In a review I co-authored in 2005, I provided information to support and emphasize two important points in this regard. The first is, when crops of novel traits are grown commercially outside for any length of time, the movement of those traits beyond their intended destination is virtually inevitable. The risk of escape increases with scale of production and of associated equipment and as the number of participants in the production and handling increases. The second is, once a given trait has escaped into the environment, which includes the agricultural supply chain, retraction is difficult if not impossible, and as such, in situations where the escape is a problem, the problem becomes persistent and likely permanent.

These points support the need for great caution and care in the production and testing of novel traits that require containment or that can cause harm, if they appear where they are not wanted or expected. The challenges in managing trait containment are many, and they include the fact that the traits are often invisible and their monitoring requires effective detection methods.

Traits can move via either pollen or seed. That movement occurs within a complex of subpopulations across the landscape, which include crop, volunteer, and feral subpopulations. Trait movement can occur via equipment or via human handling during planting, harvesting, seed cleaning, seed handling, and seed storage. Each piece of equipment and each human participant can act as a sink or a source for traits, often as seed. In this respect, each piece of equipment or human operator can be considered an additional subpopulation for a given trait or latent populations of seed.

Traits can move among these subpopulations, which taken together act as a meta-population or an overall population with respect to a given trait. In this context, responsible containment efforts must take into account all possible subpopulations and possible pollen and/or seed movement opportunities between them. In particular, it's highly dependent on detection and eradication at reception points, in the receiving crop. This is a critical consideration, because the trait reception points may occur in fields, farms, equipment, and business operations of people who are not involved and perhaps not even aware of the containment effort. So that's a difficulty.

● (0915)

The required stringency of a given trait containment system depends on the threshold level and the facility of trait escape and movement. The latter depends on the nature of the crop species and the complexity of the crop production and handling system. To be effective, these plans need to extend beyond individual fields or farms, and the plans must reflect a healthy respect for the challenges of containment.

Since commercial production in 1996, we've had long experience with glyphosate-tolerance canola, for example, in western Canada, and it shows that volunteer canola can exist as a meta-population with respect to the Roundup Ready trait. This is after unconfined release. We have published work recently that shows the accumulation of novel traits in roadside canola populations. For the Roundup Ready trait in canola, trait containment would have required—although it wasn't required—a plan that encompassed the entire region. Management for containment within a given field and for a given crop alone would have been insufficient and unrealistic.

Given the number of mechanisms leading to trait escape and the fact that escapes can self-replicate and self-disseminate and persist, those who hope to prevent it must employ all methods available. A redundancy of methods is fundamental, because even low levels of trait escape into a seed lot can easily result in significant levels of trait presence in the harvested product, even for species that are primarily self-pollinated and have very limited seed persistence, such as spring wheat in Canada.

Physical isolation is one traditional means for limiting pollen-mediated gene flow; however, it does not assure protection from trait invasion, and those working to contain traits must take into account that traditional isolation distances were established to assure seed purity, not necessarily absolute absence of a given trait or genetic purity. Isolation distances must be suited to the nature of the species and the tolerance threshold.

Another containment method is temporal isolation, often used by plant breeders and seed growers; however, traditional seed purity assurance systems were not designed to deliver the type of seed purity levels required for containing explicit trait movement. We reported in a peer-reviewed study released in 2004 that certified seed lots of canola tested from western Canada had unintended GM traits in 97% of the seed lots, in some cases at levels as high as 4.9%.

A famous example of failure of trait containment is StarLink in the U.S., where corn engineered to express insecticidal protein was approved for animal but not human consumption. There was insufficient segregation oversight between food and feed streams in the U.S. bulk commodity handling system, and the insecticidal protein was found in a number of processed foods in 2000. Three years after this discovery, and after the execution of a massive recall effort, the USDA was still finding traces of StarLink within both food and feed handling streams in the U.S.

The StarLink case showed not only that insufficiencies in containment protocols resulted in problematic trait escape, but that full retraction of traits and their products from complex and massive commercial food and feed systems is extraordinarily challenging and maybe impossible.

A more recent example is the LibertyLink rice case in the U.S., in which regulated GM rice events escaped contained field trials and were eventually found in many elements of the U.S. commercial rice supply chain, including certified seed, mills, and final consumer products in key U.S. rice export markets, including several European countries. The economic impact on U.S. rice farmers has been estimated to be in excess of $1 billion. The final cost to farmers will not be known until the nearly 3,000 cases filed against the GM rice developer have been settled.

These and other cases highlight the potential impact of trait escape and the pervasiveness of escape when it becomes part of a large supply chain.

In summary, trait development in crops is in a new era, an era that includes any and all possible traits, including traits that can have true potential human health or environmental risks, traits that can affect farming system costs, and traits that are being considered and deregulated at varying rates around the world, leading to asynchronous deregulation and balkanized farm commodity export markets. In this era, economic harm could occur when traits appear where they are not expected and/or wanted. In addition, trait movement from crop to crop across diverse agricultural landscapes and within large integrated agricultural supply chains is very complex and challenging, and if there is an escape, trait recall is difficult and could be impossible in some cases.

● (0920)

It is important, therefore, that if there is a regulatory consideration of potential economic harm, it be realistic with respect to realities of trade movement and trade containment.

The Chair: Thanks very much, Mr. Van Acker.

Mr. Raizada, for 10 minutes or less, please.

Dr. Manish N. Raizada (Associate Professor, International Relations Officer, Department of Plant Agriculture, University of Guelph): My name is Manish Raizada and I'm an associate professor in the Department of Plant Agriculture, and I'm also the international relations officer.

I was told in the early to mid-1990s that I might have been the first graduate student in the world to make GMO corn, and I'm a molecular geneticist. Before that, however, I was actually an employee of Greenpeace, so I consider myself also an environmentalist. So I'm going to try to bring in both perspectives here, as well as the perspective from developing nations.

I often get asked, are GMOs good or bad? My response is, well, are drugs good or bad?

Some drugs are great. If I have a cold, Aspirin and Tylenol are great. Cocaine is not so great. Maybe some drugs are good at low levels and not so good at high levels, so it depends.

There are lots of genes out there. It depends on the gene, it depends where you turn that gene on or off, and to me, it's all about relative risk and benefit for any particular gene, and that's what has to be assessed. And I think on both sides, on the risk and on the benefit—

The Chair: Mr. Raizada, the interpreters are having a tough time keeping up. So if you could just—

Dr. Manish N. Raizada: Slow down?

The Chair: Maybe a little bit, if you wouldn't mind?

Dr. Manish N. Raizada: Sure.

I think both the relative risks and the benefits get blown out of proportion. The theme here is relative risk and relative benefit. I've broken the presentation down into a few topics today. Again, I want to bring in different perspectives.

The first topic is ethics. I think what the population believes is that molecular geneticists are tinkering with nature; they're playing God. The perspective of a molecular biologist is the following. Remember, a transgene is breaking the species barrier; it's taking one gene from one species and putting it into another species.

From a molecular geneticist's point of view, the way we think is that species really are not that important, to be honest. I'll give an example. Genes come from other genes; they're inherited from other genes through evolution. When molecular geneticists discover a new gene in plants, one of the first things they do is look to see how similar that gene is in a bacterium or in a human, where something that looks like it may have been more studied. What that tells you is that genes are related across billions of years of evolution, because they're derived from one another.

That's a very important concept. When a molecular geneticist looks at the fact that we're taking a gene from one species to another species, it's not such a big deal, because they all came from an ancestral species from which all species are derived. In fact, 30% of human genes work in yeast cells, and potentially vice versa. Yeast cells—what you make bread from—are separated from humans by 1.5 billion years of evolution. That just tells you how related all organisms are. In fact, to me that is the greatest discovery of the twentieth century: all of life on this planet and all of its DNA is highly related.

So breaking the species barrier is not such a big deal for us. In fact, when we look at crop plants, we can become more subtle. We know, for example, when we look at corn, that corn is the ancient fusion of two different species; one of them is related to sorghum. In fact, all of the crops that we see out there are fusions of multiple species. So again, through natural evolution, it's not such a big deal.

Look at corn—again, we're talking about tinkering with nature. Corn comes from an ancient grass from Mexico that looks nothing like modern corn. It's called teosinte, and ancient indigenous peoples in Mexico bred teosinte into modern corn. To put that in perspective, what the ancient people did was take a Chevy Nova and make it into a Ferrari. What GMOs do is change the cover of the steering wheel. To me, that's really again how molecular geneticists look at it.

Even if we look at modern corn varieties—again, this is not a GMO issue—some are missing entire suites of genes and others have entire extra suites of genes. This is all natural. At the bacterial level, microbiologists are actively discussing whether they should even talk about species, in the case of microbes, because there is so much natural gene flow between species.

All of the above is more or less the perspective of the molecular geneticist.

Contrast that with an equally valid perspective from an ecologist. Ecologists definitely care about species, and they care about how those species interact in an ecosystem. If you change how one of those species behaves in that ecosystem, you can disrupt the entire ecosystem. So crossing a species barrier or changing the behaviour of a species can have drastic effects.

I think these are the two large perspectives that you see from biology. Both are valid. Both come at it from different perspectives. I just wanted to address the ethics of tinkering with nature.

On the environmental front, Dr. Van Acker talked about gene flow, and that is a real issue. We should not dispute that issue. What I would suggest is that there are tricks that molecular geneticists can do, that companies can do, to reduce gene flow.

I'll give you a simple example. We all know that we get a gene from our mother and a gene from our father. It's the same case in plants. We can develop transgenes that will only work when there are two partners—in other words, when there are two genes. Only then will they work. You can put one of these genes on the mother chromosome and in the exact opposite location put its partner on the father chromosome. Without getting further into it, what will happen, if there is pollen flow, is that one of the genes will flow, but it won't have any effect.

● (0925)

So I'm saying that there are tricks molecular geneticists can do, and which I would encourage the regulatory bodies to encourage, to reduce the impact of gene flow. In terms of reducing biodiversity, when companies create a new GMO, they do put it into a diversity of genetic backgrounds that are adapted to local environments, so that's less of an issue.

The much bigger problem, to be honest—and this has nothing to do with GMOs—is that the world is focused on only a few crop species. I suppose GMOs may make that problem worse because of the emphasis on a few species. There are potentially 20,000 edible species, and if we really want to address the global issue of food and climate change, I think the issue is increasing biodiversity. That's less of an issue than GMOs. GMOs do not take the place of practising good ecology.

Let me address human health issues. We have this concept that natural is better. I often hear this: nature is better. No, nature is not wonderful. Nature does not want to be eaten. Plants do not want to be eaten. What do they do? They produce a toxic soup of chemicals. That's why leaves are not eaten alive when you walk through a forest. In fact, in terms of land plants out there, there are up to 100,000 different chemicals on this earth that are natural chemicals. We say that chemicals are artificial. No, chemicals are totally natural, and the world is a dangerous place.

Now, in my opinion, it is exaggeration and even a myth to suggest that all GMOs are necessarily safer to humans than spraying with pesticides. If the GMO produces a toxin and if that toxin or its breakdown product gets into seeds or whatever is edible, of course it's not safe. Of course it's not; it's a toxin.

So the key is, which gene? That's the key. Which gene is it and what does it do? Does it produce a toxin or does it not? Or does it have a breakdown product that is toxic? There needs to be appropriate regulation at that level.

This gets to the labelling issue and the relative risk issue. We're very obsessed with GMO and if it's safe or unsafe. Three studies done several years ago suggested that half the carcinogens you take in on a daily basis are from drinking three to five cups of coffee—I'm looking around to see who is drinking coffee today—because the coffee bean has 100 different chemicals, several of which are carcinogens.

So we could talk about the relative risk of GMOs, but to me the bigger issue is that we do not have a good database anywhere in the world about the toxic effects of natural chemicals in our foods. I think that's the most important issue when it comes to human health. Cancer rates are going up. We do not know the natural interactions between natural chemicals in the foods we're eating in all sorts of combinations that we've never eaten before.

Some people are concerned about eating DNA. Animals have been eating DNA for 1.5 billion years and we have not turned into plants. People are worried about unintended consequences of putting new genes or DNA into plants. It is absolutely true that if you put a novel gene into a plant, it produces a protein. That protein will interact with other proteins—it might—and it might have unintended consequences. So as part of the regulation we certainly need to look at the molecular interactions. There are technologies to do that. One of them is called a microarray.

We've been eating GMOs for a very long time. If any of you are diabetic and are injecting insulin, that is a GMO product. People who have taken a human insulin gene express the insulin protein in another organism. If you're lactose intolerant, as I am, and take Lactase pills, like I do, that is also a GMO. Several of the medicines we consume are in fact GMO products. So again, we have to look at this in context.

In terms of socio-economic issues...I take students on a tour of the U.S. Midwest, and I've spoken to a lot of farmers. A lot of farmers like GMOs. They really like these new traits; they're fantastic and they work very well. However, what farmers do not like is being forced by the companies that have their best breeding stocks.... They have no choice. If they want to get that best breeding stock, they have to get the GMOs with it, or they have to get combinations of GMOs, whereas they might like some of the GMOs, but not the others.

● (0930)

So I think that's important.

I think if you're going to impose novel regulations, there's a trade-off here. The trade-off is it takes hundreds of millions of dollars to get a GMO to market today. That is reducing competition and increasing the monopolies in this area, which is a concern, I think, for everyone.

Lastly, and very briefly, on the international side, a GMO is not going to feed the world, as was mentioned earlier. There's no silver bullet. What underlies global poverty in Africa and Latin America and Asia is a number of things. It's poor access to good seed. It's lack of fertilizers. It's lack of irrigation. It's lack of agricultural extension officers. A GMO is not going to solve any of that.

However, GMOs have a place, particularly when it comes to traits that have to do with ecological interactions, and by that I mean insect resistance and disease resistance. They seem to work very well. What might be game changing in this area is that while we're talking about introducing one gene or a few genes, there is now a technology available to introduce entire chromosomes. There's a company called Chromatin that's doing this. They have the upcoming ability to introduce entire artificial chromosomes into plants, which means one can potentially introduce thousands of genes at once.

Thank you.

The Chair: Thank you very much, Mr. Raizada.

We'll now hear from Mr. Derek Penner and Mr. Mike McGuire from Monsanto Canada, for ten minutes or less, please.

● (0935)

Mr. Derek Penner (President and General Manager, Monsanto Canada Inc.): Thank you, Mr. Chairman and members of the standing committee, for the opportunity for Monsanto Canada to appear before the standing committee.

My name is Derek Penner, and I am the president and general manager of Monsanto Canada. I am joined by my colleague, who is our vice-president of sales and marketing for our corn and soybean business in Canada.

I'm a Canadian who grew up in Winnipeg. I have been employed in various positions within Monsanto since 2002. Last fall I was appointed to my current position, leading our Canadian business. Prior to this role I spent the last couple of years in Europe, as Monsanto's director of strategy, licensing, and product management for the Europe, Middle East, and Africa region based in Europe.

As a company that is 100% focused on agriculture and a leader in the field of applying the science of biotechnology to agriculture, I certainly appreciate the opportunity to speak to you today about our work in Canada and throughout the globe.

During the brief time I have been allotted today, I thought I would review our presence in Canada with you, which, in addition to our eastern business office here in Guelph, extends across Canada. I also want to share a bit about our pipeline of beneficial products that has been embraced by Canadian farmers; touch on our industry as a whole and the value and benefits of agricultural biotechnology to Canadian farmers; and finally, reiterate our support for the current science-based regulatory system in Canada, which is critically important to our ability to invest in this country and bring the solutions to growers they are demanding on their farms to run profitable businesses.

On this last point I want to thank the committee for taking the time to look at our industry and ask the questions that will keep it vibrant in the years ahead. The future development and investment in crop technology research in this country is obviously important to our business and to farmers. We want to work cooperatively with our industry colleagues and farmers to continue to bring forward innovative products that will benefit the agricultural sector in this country.

Monsanto Canada employs approximately 280 full-time and part-time people, at 15 different locations and facilities across Canada. In addition to our head office in Winnipeg and our eastern business office in Guelph, we also have a government and regulatory office in Ottawa; a seed manufacturing facility in Lethbridge; research farms in Saskatoon, Yorkton, and Edmonton; breeding facilities in Carman and Oakville, Manitoba, and Oakville, Guelph, and London, Ontario; and a seed production facility in Cranbrook, British Columbia.

Recently we completed the construction of a $12 million state-of-the-art breeding facility in Winnipeg, located adjacent to our head office at the University of Manitoba. I would encourage the standing committee, if you have the time, to come and visit that facility. We would be more than open to share that with you. We are also in the process of investing another $12 million in the upgrade and expansion of our seed manufacturing and canola breeding centre in Lethbridge, Alberta.

It is at these facilities that our research into introducing favourable traits in crops that include corn, soybeans, and canola takes place, and it is where we field test the commercial products that have come out of our extensive research pipeline. These traits, which include weed and pest resistance, yield enhancements, and stress tolerance traits, such as cold or drought, hold considerable potential for the future of agricultural production.

We believe it is important to have Canadian regulatory agencies review the food, feed, and environmental safety of all products of biotechnology. The current system has ensured the safety of the current biotech crops on the marketplace today, and it gives Canadians the confidence that these products are safe. Indeed, they are. Since their introduction in 1996, more than one trillion meals containing biotech crop ingredients have been consumed without a single reliably documented case of harm to either humans or animals. The continued review of these technologies for food, feed, and environmental safety, using a science-based system, sends an important message to our customers around the world that these products have been comprehensively reviewed and they are deemed safe.

We fully recognize that regulatory approval alone doesn't give us permission to proceed with commercial introduction of future products, but it is a critical first step to addressing any issues associated with consumer acceptance of biotech crops. In this regard, we continue to work with other industry players and farm associations in Canada to ensure all products are introduced responsibly and with comprehensive stewardship plans, to not only protect the technology and those who are embracing it, but to ensure that those who want to make a different choice are not negatively impacted.

There is precedent to show that market issues related to the introduction of biotech crops can and have been addressed effectively by the industry. A good example of this can be found in the introduction of transgenic canola in Canada. Working together, farmers and the industry were able to capitalize on the benefits of biotechnology and maintain trading relationships with key buyers throughout the world.

● (0940)

In 2000 the Canola Council of Canada did an economic assessment of the introduction of herbicide-tolerant canola in western Canada. It found that from 1997 to 2000, an incremental cumulative value of up to near $500 million was created for the industry.

Our work is directed at facilitating unburdened access to innovative new technologies that will allow Canadian farmers to remain competitive in a global market. Delivering innovation to the farm starts with research and development. This year Monsanto invested more than $1 billion to develop the most robust pipeline of products in the industry.

Today our researchers throughout the world are actively working to discover, develop, and deliver the next generation of agricultural products so farmers can get more out of each acre of farmland. Everything we do at Monsanto is aimed at helping to make agriculture more productive and more profitable for farmers as well as more efficient and more sustainable for our planet.

Canadian farmers are strong adopters of technology, and they are demanding solutions to help produce more to feed a growing planet while reducing agriculture's impact on the environment. Biotechnology is one tool that can help address these demands. Our ability to conduct and complete research in Canada is critical to allowing us to adequately and accurately answer the many questions farmers and others have asked us to look at.

These are some of the reasons Monsanto continues to invest in the area of agriculture biotechnology and to work with the industry in finding solutions so that new technologies can be brought forward in a positive and responsible manner.

In closing, the research we have undertaken internally, with academics, and with other third-party researchers into bringing new biotech traits to crops like corn, canola, soybeans, alfalfa, sugar beets, wheat, and vegetables indicates that Canadian farmers are searching for new, more economical and sustainable options to enhance their yields and their profitability.

Biotech crops have offered farmers a compelling value proposition, including product effectiveness, yield improvement, simplicity, conservation tillage enhancement, cleaner grain, no crop restrictions, and a solid environmental safety profile.

Canada must continue its leadership position in the biotechnology sector by defending its science-based regulatory system and challenging unjustified trade barriers that are inconsistent with WTO trade rules. We have been encouraged by the positive feedback we have received from Canadian farmers, and indeed farmers around the globe, and we remain fully committed to working with the industry and with government to find manageable and effective solutions to allow the benefits of biotechnology to be shared with farmers, industry, and consumers.

Finally, I would like to bring to the committee's attention an announcement made at the World Economic Forum in Davos, Switzerland, this past week, at which a coalition of 17 companies and governments from around the world, including Monsanto, launched a strategy to improve food security, economic growth, and environmental sustainability by improving productivity and the pace of growth of agriculture.

There's a brochure online called “Realizing a New Vision for Agriculture: A roadmap for stakeholders”. I would encourage the committee to download that. This roadmap sets out ambitious yet critical targets for increasing production by 20%, decreasing greenhouse gases per tonne of production by 20%, and reducing rural poverty by 20% in each of the next three decades. You've heard a lot about that over the last few years and about population growth, and I think this piece is another critical component of the standing committee's notes.

Thank you for your time.

The Chair: Thank you, Mr. Penner.

If you wouldn't mind forwarding the document you just referred to in your report, either to each member of the committee or at least to the clerk, that would be good.

Mr. Derek Penner: Yes.

The Chair: Thank you.

Last on this panel, but certainly not least, we have as an individual, Mr. Frank Ingratta, president of Ingratta Innovations Inc.

Welcome. Please go ahead for 10 minutes or less.

Dr. Frank Ingratta (President, Ingratta Innovations Inc., As an Individual): Thank you, Mr. Chair.

And thank you to the committee for affording me the opportunity to participate in the deliberations on this significant issue.

Since I am listed on your agenda as an individual, not representing an organization, I believe a quick background will provide some insight as to why I've been called as a witness.

I have recently retired, after eight years as Deputy Minister of Agriculture, Food and Rural Affairs for the Province of Ontario, and I was actively involved in the development of agricultural policy and regulation, both provincially and nationally. Prior to 17 years in administration with the ministry, I was involved in numerous scientific and technical committees. For example, I chaired the Canada Committee on Crop Production and the Canadian Expert Committee on Horticulture. Lest I get branded as a technology sycophant, I also participated in the first federal-provincial committee on the development of standards to foster the development of the organic food industry. Interestingly, it convened at Meech Lake in the early nineties.

Additionally, I'm the vice-chair of the board of directors of the George Morris Centre, which is broadly recognized as Canada's leading agrifood think tank. After more than 20 years of quality analysis, the centre has earned a strong reputation in agrifood strategy, policy development, regulatory commentary, and for constant support for economic viability and competitiveness of the Canada agrifood systems.

With regard to today's issue of regulation of genetic modification, the centre clearly supports safe technology, which would improve the competitiveness and profitability of Canada's farmers and food industry. In their most recent newsletter, Schmidt and Stiefelmeyer pointed out the negative impact of antiquated and unnecessarily restrictive regulation. The centre has accumulated significant data and expertise on this topic, and I'm convinced that should this committee require an in-depth analysis of regulatory options, the centre could provide excellent technical and strategic advice.

So I have both a policy and a technical background, but I will admit that the technical background is certainly not as current as some of the other colleagues in the panel this morning.

Today I'd like to provide you with my own explanation of the issue, discuss some of the options, and, with your indulgence, provide broad comments on a recommended course of action. Unless I'm very wrong, the issue in front of us today is not whether Canada should support the use of genetic modification technology or drastically restrict its use. Quite clearly, the advantages of genetic modification have been repeatedly demonstrated. Biotechnology was identified in the *Harvard Business Review* at the turn of this century as having the potential to impact both the economy and innovation even more than the digital revolution of the eighties. The examples range from gene insertion to achieve cold tolerance to stem cells used to dramatically improve healing of skin burns. So I believe our focus today is not to discuss whether genetic modification is good or bad; my comments will focus on the appropriate regulation of the industry.

In my view, regulation is the basis of the development of a strong industry. In order for the technologies to continue to advance, a set of well understood and consistent rules is required. Regulations need to be based on fact, on science, on safety and security of the environment and the people of Canada. They cannot be whimsically based on some litigant's moralistic view or a longing for a return to a bygone era. Regulations need to be transparent. Those developing the technologies need to know the rules, but they must be transparent enough so that those who need assurance that the rules are being followed have an appropriate opportunity to participate in the process. For too long, opponents have argued potential bias in the research innovation community. Transparent regulations can minimize this lament.

For many of the new biotechnological developments, the resulting products are international in scope and potential utilization. Although I would not support the wholesale adaptation of another jurisdiction's rules, surely the science behind the testing for safety, efficiency, and repeatability can be shared by regulatory agencies around the world.

On the issue of other jurisdictions, I'm sure this committee is aware that in the United States the House Committee on Agriculture is currently examining the exact issue that's in front of us today. Appearing before that committee only 20 days ago, Secretary Vilsack extolled the potential of biotechnology but concluded, and I quote:

> ...conflicts have produced ongoing litigation and resulted in uncertainty for producers and technology innovators. We are at a crucial juncture in American agriculture where the issues causing the litigation and uncertainty must be addressed, so that the potential contributions of all sectors of agriculture can be fully realized.

● (0945)

In the U.S. there are currently two options: either to grant or deny non-regulated status, and over 750 products have been granted the non-regulated status. They are currently considering the option of granting unregulated status with geographic restrictions and isolation distances to accommodate the individuals who demand certainty around genetic drift.

It's also germane to note—and it's certainly not as recent as articles in today's newspapers—that the Pontifical Academy of Sciences, with a membership of more than 20 Nobel laureates, has requested a relaxation of excessive unscientific regulations currently in place in some jurisdictions for improving genetically modified crops. Even the European Union is considering the easing of import restrictions on genetically modified crops as part of rewriting the overriding common agricultural policy.

It is my opinion that new regulatory challenges will arise in the near future. Today there are many samples of genetically modified crops with altered input traits, such as insect resistance, and a growing number with environmental traits. A few years ago, I had the opportunity to review a horticultural research program in Chile where they featured 9,000 genetically modified peach seedlings capable of growing in highly saline soils and created as a result of their natural resource extraction—an example of environmental traits.

However, the significant future impact will be from output traits—or, if you will, consumer apps—in which altered crops will have human health benefits, such as reduced trans fats or vitamin enhancements. The only logical regulatory system to govern these new traits is one that is based on scientific evidence of safety to the consumers and to the environment.

The real challenge of regulations is that invariably one size does not fit all. With the dramatically different innovations that currently exist and that are on the horizon, it is important that relatively mundane changes do not endure the detailed scrutiny logically required for a modification that has real potential for a dramatic impact.

The regulations also need to be clear on whether we are regulating a process or a product. Regulations are not put into place to ensure an improvement to the innovator's bottom line, but there should also be opportunity to consider the potential positive impacts of an innovation. If the innovation truly has the opportunity to reduce hunger or increase production in inhospitable environments, that should form part of the scientific and policy considerations in utilizing that technology.

In summary, regulation for genetic modification should not be differentiated from the characteristics of good regulations, whether it's the Highway Traffic Act or for monitoring financial institutions or looking at the pharmaceutical industry. The regulations must be current, based on best available science, and not driven by vested interests. They must ensure safety of citizens and the environment, be flexible enough to accommodate diverse technologies, and be transparent to all and efficient in application. For the most part, Canada has that type of regulatory system. The rules for utilization of genetically modified technology must meet those standards.

Thank you.

● (0950)

The Chair: Thank you very much, Mr. Ingratta.

We'll now move right into questions. We just have the exact amount of time for everyone to have another round.

Mr. Valeriote, because this is your riding, you get to go first. You have seven minutes.

Mr. Francis Valeriote (Guelph, Lib.): First, gentlemen, I want to thank all of you for taking time out of your busy schedules to accept the invitation to come and speak before us. We all appreciate that GMO is a tool that's going to be used, one tool of many, to fight growing hunger, feeding three billion more people in the next 40 years—and increasing food production by about 70%, I'm told, will ultimately be the need.

We've heard so much, and there are, as I have described, two solitudes out there. I don't know if these two solitudes can ever reconcile their differences, but without getting into all the incidents today, because it's impossible—Manish, you discussed a number of regulations you thought would be important tricks that can be used to reduce gene flow and look at molecular interactions to avoid toxicity. Rene, you talked about possibly developing not barriers but buffer zones. I gather that's based on what I've read from the Canadian Seed Growers' Association—identity-preserved isolation distances.

Frank, you were in politics. It seems to me you had...not politics as such, but you were a deputy minister, rather. Thank you—I'm sure you're pleased I corrected that. It seems to me—and Derek and Mike—you're in the business. Michael, you understand it historically. It confounds me that it took Bill C-474 to bring this conversation to a crescendo, because Bill C-474, by most of our responses, isn't the answer. It certainly has raised issues that need to be discussed. I'm talking about, for instance, the right of organic growers to be able to grow their crop without threat of contamination. It's not an easy solution, but it's a simple proposition. I'm wondering why, if any of you, or all of you, have the compulsion—because we're not going to be able to do it—to come together, revitalize the Canadian Biotechnology Advisory Committee, bring everyone together, and start having the discussion so we can find these solutions.

Don't rely on us. It's better that the solution comes from the industry. Can you guys address that? Rene, you talked about buffer zones. Is it realistic to introduce that, manage regulations? Frank, you had some ideas. Can we discuss that?

● (0955)

Dr. Rene Van Acker: If I could comment a little, the first thing is I don't think it's two solitudes, to begin with. There's a lot of pragmatism in this issue. I think when we saw the concerns around potential introduction of GE wheat in western Canada, what you had was farmers who loved their Roundup Ready canola saying that while they loved their Roundup Ready canola, they didn't want to see GE wheat if it were going to cause a market threat. It was very practical and pragmatic. It wasn't philosophically based at all. Many of the same farmers would adopt GE wheat if the markets went away. I see it as a very practical thing for many people and for many of the farmers involved, so I don't see it as two solitudes. That's part of the dilemma.

The other thing is there is a question about the nature of maintaining zero, given the article in the European press about the potential changes. Are Europeans allowing unauthorized traits? That's something that has to be discussed, because what is our own policy in Canada in that regard? Right now, our policy is a threshold of zero for regulated events. Will we change that? We argue that the Europeans need to change that, but if China, for example, wanted to export something to Canada that would not yet be regulated in Canada, what would our policy be? Currently, our policy is zero.

It's not simple. It's not black and white, and it's not two solitudes. I think people want choice and guarantees.

Mr. Francis Valeriote: Do you think that a low-level presence...? We spoke to Mary Buhr two days ago in Saskatchewan, and she indicated that perhaps low-level presence has to be adopted here as well, because zero is just not realistic.

Dr. Rene Van Acker: I think we have to think very carefully about what we say when we say that. I think we would want to hold the option for low-level presence where we think it's okay, because we want to maintain the efficacy of our regulatory system, and we want to maintain our right to our own regulatory system.

Mr. Francis Valeriote: Are these buffer zones realistic?

Dr. Rene Van Acker: Again, it depends. What I will say is that if we produce something on a commercial scale, maintaining a zero is probably not realistic. I think the supply chain would agree with that. It's difficult in a broad landscape.

Mr. Francis Valeriote: Do others want to jump in here?

Yes, Frank.

Dr. Frank Ingratta: I'd like to comment on the issue of where we find the solutions. Certainly the committee is making a significant effort in hearing about potential solutions. Part of the reason I even mentioned the Pontifical Academy of Sciences is they are a body of significantly knowledgeable people who come together to discuss a broad array of issues.

As our political leaders, you have a mammoth number of issues that confront you. There really is an opportunity for...and I believe strongly in the ability of the participants in the industry to come together, share their views, and discuss and debate them. That is where the solutions can come from, as long as government is involved and ready to listen to those dialogues and help shape the policies and regulations based on those varied views.

Whether it's the committee that you've mentioned or some other organization, it is absolutely critical that the broad range of views, whether it's two solitudes or not, be able to come together and develop, through some significant debate, some of the regulatory details that we're talking about. I certainly encourage that activity to restart or perhaps follow one of the recommendations coming from the committee, which would be to create such an organization. It is critical to finding that solution.

● (1000)

Mr. Francis Valeriote: Derek wanted to add to that.

Mr. Derek Penner: I have a couple of comments.

First of all, we do need a level presence policy in place. Mr. Van Acker alluded to zero not being realistic, and it is crystal clear that's not realistic along the supply value chain.

The one thing I would like to make mention of, which Mr. Van Acker also alluded to, is China. There are one billion people in China. China is investing 1% of its GDP in R and D specifically around biotechnology around the world. We in Canada and even North America are leaders in the regulatory and scientific approval process and in bringing forth biotech trades. We've been in the industry for 20 years, commercially for the last 15 years, and we need to take a leadership role in developing those policies.

At least from my viewpoint, a lot of the countries from around the world look to Canada as a leader in developing policies and procedures. With China coming on board, we really need to have something in place to have a nice dialogue with them. As Mr. Van Acker said, what are we going to say when these AP or LLP come into place when exports from China come to Canada? We need to have a solution and be ready, not be reactive.

That's my comment on that.

The Chair: Thank you.

We'll move to Mr. Bellavance.

[*Translation*]

Mr. André Bellavance (Richmond—Arthabaska, BQ): I would first like to turn to Professor Raizada.

Since I know how perceptive Frédéric, our Library of Parliament analyst, is, I am sure that you will be quoted in the report that the committee is going to write. Your position is completely balanced. In fact, I have never personally seen groups opposed to biotechnology. But we have seen groups opposed to genetically modified organisms. So we have to look at things from both sides.

When you tell us, for example, that insulin is a genetically modified organism, as are a whole bunch of medications like whey and so on, I don't think that anyone at all familiar with the area will suggest that everything should stop because they are GMOs. So I am swayed by that kind of balanced opposition. I'm sure that I can also speak for my party, the Bloc Québécois, in that sense.

But you are also telling us that we do not have enough data yet. That means that we do not know all the effects on health and on the environment that genetically modified organisms can cause. So it is entirely healthy for this debate to be taking place. It is wrapped up in the whole question of social acceptance.

That being the case, I would like to turn to Mr. Penner.

In previous testimony to the committee, we have heard about the importance of communication and of information. For large companies, that very often means propaganda done by highly paid public relations people using all the means and resources at their disposal. They want to drive the idea into people's heads that their products are good.

What is important to me in communicating information is transparency, and I feel that the public wants that too. Consumers want to know exactly what is on their plate. Agricultural producers want to know what kinds of seeds they are using and what effect and economic impact those seeds have. The approach is different, but it is clearly vital.

With regard to Monsanto, I won't go right into your area because I am not sufficiently familiar with it. I would rather have your reactions to what is public, to what we know, without necessarily responding to each and every matter I'm going to briefly mention. Are you aware of the whole area of social acceptance?

Scientists have talked to this committee about contamination. It is a recognized fact, as is release. The monopoly you have is clearly causing problems in a number of countries. The United States Department of Justice is conducting hearings on this at the moment. In West Virginia, there are lawsuits against you about soya. You are also involved in a dispute with India, specifically about problems with parasite resistance.

We don't have to go very far to find issues of contamination. We have just come from Saskatchewan, where a 72-year-old farmer called Mr. Schmeiser lives. I'm not a Supreme Court of Canada judge, and I know he lost at the Supreme Court. But all the resources and money you used against that 72-year-old farmer could perhaps have been better used developing buffer zones, for example, zones protecting against the release of genetically modified seeds.

A 72-year-old man who had developed his own variety of canola found himself facing a giant like you in court. In terms of social acceptance, there was certainly a lot of media buzz about that. A huge multimillion-dollar company attacks a 72-year-old farmer who developed his own variety of canola, takes him to court and crushes him.

That is very much the tone of the debate. The history of large companies that make GMOs increases public concern. All your communication, all your information, however valid it may be, can be tarnished by examples like that, examples that people see, not only around the world, but also here in their own backyard.

Are you aware of that?

● (1005)

[*English*]

Mr. Derek Penner: Thank you, Mr. Bellavance, for your question. You loaded it up quite a bit; you addressed quite a few issues there.

First of all, I would say that Monsanto's policy, globally, is that we are transparent with what we're bringing to the market. We've always said that we work very closely with our stakeholders, both industry and consumers. If I take an example in Canada, we have a grower advisory council, which includes growers across Canada—western and eastern Canada stakeholders. We have the wheat growers association, the Canadian Canola Growers Association, the Canola Council of Canada, the Ontario farm grains association, which are all part of that. We work with them and we listen to the issues and concerns, because it is the farmers who are the centre of attention.

On addressing the monopoly issue, I think it's one of those things you think about back when biotechnology was first introduced in 1996. Yes, I would argue that Monsanto was an innovator and brought technologies to the market, but we sit here 15 years later and there are numerous competitors out there with competitive traits. Farmers not only have choice in technology and biotechnology, but they also have a choice in genetics they can purchase.

With regard to the Percy Schmeiser case, quite honestly I wasn't expecting that particular question to come up. I would say that Monsanto's position.... I don't know whether Mike has any further comments on this, but he did not develop his own traits. It was clear in the ruling and the evidence that was presented to them.

If I look across Canada and around the world, we have 60,000 growers in Canada alone. We don't go out and specifically target people to go after them. In the case of Percy Schmeiser, it was someone, a grower, who appreciated the patented technology we brought forth and the benefits the farmer received from that technology, and who alluded to us that he was actively stealing our technology.

So we take that case seriously. We need to protect our investment. We spend $1 billion a year, and the 59,999 farmers across this country also respect that.

● (1010)

[*Translation*]

Mr. André Bellavance: As I told you, Mr. Penner, I do not intend to go back over the…

[*English*]

The Chair: You're actually over time, unless it's just—

[*Translation*]

Mr. André Bellavance: I certainly didn't want to go back over the Supreme Court decision. What I want to emphasize is the public perception when a huge company goes after one farmer. That is why I brought it up.

I am talking about public perception. As I said, I am not a Supreme Court judge.

[*English*]

The Chair: Okay. Not to put words in Mr. Penner's mouth, but I think he understands where you're coming from. He was just commenting.

Did you have anything further to add?

Mr. Derek Penner: Mr. Chair, I think I alluded to the fact that we have a number of growers, and you look at, statistically speaking.... We understand the perception people have of Monsanto. But if you did a sample with the growers across Canada and the U.S., where biotechnology is accepted, I think even as you start going into the Latin Americas—Argentina and Brazil—the demand and the willingness to pay for that technology is there.

It's unfortunate that...we live in a free market society, and we have a large company that's grown over the past number of years. But that's the reality we live in. We understand that issue and we have to work with those perceptions.

The Chair: Thank you.

We do have to move on. We're going to be tight for time.

Mr. Shipley, seven minutes.

Mr. Bev Shipley (Lambton—Kent—Middlesex, CPC): Thank you, Mr. Chair.

Just to clarify to my good colleague, I think we really need to understand that Bill C-474 did not bring this issue to the top. Bill C-474, as you know, is being debated. It is a bad bill because it is incomplete. I know we're the only ones who didn't support it, but it did not bring this to the....

And I really appreciate everybody taking the time to be here. I've been in agriculture all my life, and in biotechnology since 1996, which 15 years later leads me to this question. The biotechnology we see now—it was talked about in a study—is emerging. I just want to understand a little bit about it. Is this seen as emerging technology, or is it a technology that I see is about to burst—and maybe I'm wrong—wide open?

I'd like your comment. Where is it for agriculture and the consumer? What is this doing for both of those? I agree it's one of these tools, but I think things are happening so much in agriculture. As I said, I think those in agriculture right now, in the industry, are in one of the most fantastic and resourceful times the industry is ever going to experience.

Mr. Raizada, your comments, and Mr. Penner also, and then Mr. Ingratta.

Dr. Manish N. Raizada: What we have now that we didn't have 10 years ago is the entire genetic codes of many, many organisms—bacteria, plants, animals—so that we have a much better ability to take genes that we have a lot of information about from one organism to another. Because of that, the technology is going to explode. In other words, the suite of genes that are out there as tools is about to explode.

The balanced view on this would be that, so far, if you look at crop improvement around the world, GMOs have played a minor role, and I say that as a molecular geneticist. It's the traditional breeders who have had a much bigger impact on yields.

The reason is that basic yields have to do with many, many genes. You have to make minor modifications to many genes, generally speaking, to increase yield. That's called primary metabolism. Where GMOs will have a significant impact is on what's called secondary metabolism. That's how an organism interacts with its environment, such as insect disease resistance.

GMOs can have a big impact, but it's going to be limited to a certain area. The other area in secondary metabolism has to do with interesting traits like nutraceutical traits. It will have a major impact.

There are traits where a single gene, or one or two or three genes, can have a major impact. And there are other traits where that's exaggerated.

● (1015)

Mr. Derek Penner: I'm not a scientist, but I would argue, based on the data that I've seen, that GMOs have played a significant impact on crop yields over the past 15 years. I'll allude to a couple of examples and then I'll pass it over to Mike.

One example comes from here in Ontario. If you look at years prior to the introduction of GMO corn to Canadian farmers, farmers were realizing about 112 bushels an acre, on average. Back in the 1930s, you were looking at 30 or 35 bushels an acre. So yes, you saw a lot of improvement. But if you look at the last 15 years, and you look at it proportionately, now farmers are getting nearly 160 bushels an acre with GMO varieties.

Also, there is a European example with Bt corn. These are Monsanto's studies, so we had U.S. third parties. We looked at data over the last 10 years of various Bt corn versus conventional varieties. And it was clear that on average over those 10 years there was a gain of half a metric tonne per hectare over the conventional GMO varieties.

So I'm not a scientist by background, but those are data points that I see as working well.

Mr. Mike McGuire (East Sales, Marketing Lead, Monsanto Canada Inc.): Thanks, Mr. Chair.

I bring the perspective of a decreasing demographic—those who have lived pre-biotech and post-biotech. There are fewer and fewer people who have been able to see the pre-biotech era and the post-biotech era. I can comment on both.

One of the biggest advantages we've seen in the biotech on growers is that growers work in an environment where there is total risk—weather, crop prices, and other risks—in an uncertain environment. One of the things biotech has brought to growers is more certainty.

If you look at average yields, the traits we're bringing in biotechnology are taking out the effects of dry weather, bug infestations, and weeds. So one of the great things about biotech is that growers aren't having as many down years. The dry year, the year where weeds are a problem, a year where pests happen—these misfortunes are offset by the insurance policy built into the crop.

When farmers have a bad year, it takes five or six years to recover. When you speak with growers, one of the things they speak about time and time again is that biotechnology has taken some of the risk out of farming, which is a major improvement over the pre-biotech era.

Dr. Frank Ingratta: Your basic question is, has it exploded or is it going to explode? I think it has exploded on the agricultural scene. When you look at the acreages and the productivity increases in the acreages that are planted with genetically modified organisms, it's already happened. The explosion has happened.

But I think the real explosion, as in the digital technology era, will be when the consumer apps come to the fore. Everybody has a home computer now because of their ability to access the Internet. When all you could do was control the temperature in your house or small things, it was not a big deal. When the consumer apps happened, it exploded. And I think that's what we're going to see in the future. It's not so much the impacts on the farmer as the potential impacts of food products on consumers, especially in the area of health.

There is a lot of promise. There are not a lot of hard examples today, but there is a lot of promise, and that's where the explosion is going to be. That's why you talk about the need for the regulations to be current so we'll be able to deal with that explosion. Other than the issue that's here today, there is a future issue that's going to be even broader.

Mr. Bev Shipley: Thank you.

The Chair: Mr. Van Acker, very briefly.

Dr. Rene Van Acker: Yes, there are just two things. One, I hope we can be clear that we're talking about GM in agriculture and not industrial biotechnology. That's very important here.

Two, there's a good paper by Thijs Tollenaar and Liz Lee put out on cross-science in 2007 that is a detailed analysis of yield increase in corn over the last 100 years. Thijs currently works for Monsanto in the RTP and was formerly a professor in corn physiology here at Guelph. I can get you that paper if you want. It points out and backs up Manish's assertion that it's a polygenic issue.

● (1020)

The Chair: Thank you very much.

We are going to have to move our last round to five minutes, Wayne and Randy.

You have five minutes, Mr. Easter.

Hon. Wayne Easter (Malpeque, Lib.): That's not a problem.

Thank you, folks, for coming.

I want to start where Mr. McGuire left off, and that was talking about the improvements that are there with biotechnology. What is clearly obvious to us is the tremendous...and maybe it comes from the Frankenstein foods that Michael mentioned earlier. But there is such a misunderstanding that biotechnology is exclusively GMOs and it's not. I guess it's one component in the tool chest.

The other area that relates to that, and what I'm really coming at, is how do we get a better understanding out there in the general community, not only on GM but on biotechnology? We're getting over Bill C-474. Bev, you're wrong. We didn't support Bill C-474; we supported the discussion, and we'll be voting against it today.

Frank, you said the potential bias to biotechnology—I think you meant companies—has to be overcome, or that perception that there's a potential bias there. How do we do that? I hear some horror stories on corn strains in Mexico as a result of GM corn moving into Mexico. It's the reality. There's a lot of power by Monsanto, Syngenta, and others...farmers always having to go back to get their seed stock. There's certainly economic profitability in doing that, I will admit.

But how do we get to a transparent system that's not overly cumbersome for companies that want to make the investments but is understood by the public that it is based on science, that it is based on safe food and the protection of the environment?

Dr. Frank Ingratta: When I was referring to the issue of bias, so often we hear the lament...and even in recent days the University of Guelph has been charged with being unduly concerned with the positive aspects of biotechnology, and some would argue it's because dollars do flow in certain programs from industry to support their research. So it automatically makes them biased. It always annoyed me that this was even publicly stated. I have a great deal of respect for the integrity of the research community, but as soon as they're funded by a multinational, there's a perception of bias.

My argument is around transparency, making it very clear that, yes, that financial support is there, but also making it very clear what the intents and the outputs of those programs are so that people can examine it and not have this grand conspiracy theory that the researchers and the multinationals are coming together. That's why I talked about transparency. I think the regulation needs to be transparent in the development. By that, I mean involve the input from all parties. Eventually you're going to have to make a decision, but input from all parties and the access to the information that's developed...I think that's critical.

I know that's a bit of a wishy-washy response, but I think constantly ensuring that this information is available will help the general public understand, and again, example after example of where there are positive impacts, and when we start having examples where there's a positive impact on individuals, not just on producers' ability to improve their profit here....

● (1025)

Hon. Wayne Easter: One of the problems here, though, is that we depend on company data. There's not a public institution that doesn't have perceived benefit, I guess, that is there. We depend on company data for some of this analysis, and that certainly doesn't lead to transparency. Is there an area we can move there?

The Chair: Touch on that very briefly because we're—

Mr. Mike McGuire: I think the way Monsanto looks at it is that we create the data, but we don't write the test. There are certain things we need to deliver up to get regulatory approval. We don't get to decide what we submit, but we do have to submit a robust data package for all the technologies we propose be advanced. Those are scrutinized. People come back with questions. They ask us about our data and how we obtained it. I like to think of it as our having to incur the cost of creating the data. We don't get to pick what we submit. We submit what's required, and we're obligated to commit to a full regulatory approval. So I think a distinction needs to be made there.

The Chair: Mr. Raizada, you were nodding your head.

Dr. Manish N. Raizada: Could I just suggest that on the transparency issue, when Monsanto issues a patent, that's a public record. It's a very detailed, wonderful public record, and it's very rigorous. I would suggest that to improve transparency, that public record, that patent, should be linked to a database. It's out there, and it's very detailed.

The Chair: Mr. Hoback, you have the last five minutes.

Mr. Randy Hoback (Prince Albert, CPC): Thank you, Chair.

Thank you, gentlemen, for coming here this morning. I apologize for my tardiness. The flight here from Ottawa this morning took a little bit longer than we expected, so I apologize to Dean Emes for missing his presentation. I look forward to reading it later on.

First of all, we've already beat up low-level presence. At every meeting we go to, everybody says low-level presence needs to be addressed. I think the minister understands that, and I think the Europeans are starting to understand that. I think there are minds smarter than mine that are going to decide what that low-level presence should be, but I understand that's something everybody has identified as something that needs to be worked on, on a global basis.

I'm kind of curious about a couple of things. First of all, it seems that a study on biotechnology always turns into a GMO study. That's unfortunate, because GMO, as Wayne said, is one tool in the tool box, yet we're going to see new technologies, like genomics and other ideas, coming forward, which could produce exactly the same traits you're getting through GMO. For example, I wonder what the response would be if we used genomics to make alfalfa Roundup resistant instead of a GMO. Would that be there?

In fact, there are some people in the ministry who are telling me that once some of the patents come off on the GMO side for Monsanto, the people who are opposed to GMOs will all of a sudden not have a problem with them, and that it's more of an anti-Monsanto trait than anything.

It's unfortunate that, as you said, Mr. Penner, that is a reality that you live in and have to deal with it.

Wayne touched on something that I think is important, which is the communications through the regulatory process. In Saskatoon, we saw how they did their cuts in the petri dish and took those through to get the traits, which was interesting. It seems to me that the regulatory system is very closed and controlled. Is that a fair comment? So before a new product even goes into commercialization, we've gone to the regulatory system in a very closed environment so that there's no threat of contamination from outside. Is that a fair comment?

Dr. Manish N. Raizada: Yes.

Mr. Randy Hoback: Okay. If we do that for regulation, what is the purpose of registration then? In western Canada we go through regulations, and again we acquire that data set. We do all that work, and we basically come across and say, “Hey, this is fair. This is safe. There's no problem here.” But then we go to a second panel for registration, which is a two-year process that now selects the variety based on whether it is profitable or on other non-science-based information. Is that process still effective? Is it still needed?

Mr. Ingratta, with your experience, what would be your opinion on that?

Dr. Frank Ingratta: The registration process is somewhat separate, like your series of field trials, to demonstrate that in fact it is better. We traditionally follow not only consumer protection, but also a pattern of ensuring that it's better than what currently exists. So the registration process, if you will, assists in a time to demonstrate that not only is it resistant to herbicide X, but it is in fact better and more productive than what currently exists.

I wouldn't want to shelve the registration process in its entirety, but if there were an opportunity to streamline it or have it concurrent with other processes, that might be the solution you'd be looking for.

● (1030)

Mr. Randy Hoback: That's an interesting comment, because that's what I heard from some of the researchers. They were saying the same thing. They didn't want to see the registration process disappear, but they thought there was data they gathered during the regulation process that they could utilize and streamline the registration process.

Mr. McGuire.

Mr. Mike McGuire: I think a good example is corn. In corn, variety registration ceased several years ago, probably about 10 years ago. We aren't registering varieties. The school of thought there was that companies are going to be motivated to bring out better varieties; if they brought out a lesser variety, they wouldn't last very long.

So what we committed to do as an industry...we would not have to enter corn varieties into registration trials, but the industry committed to entering into performance trials so the growers had the data from a third party and everyone could see how these products performed. It's a good assumption: companies will bring out better products because that's what they want to do. But then we agreed as an industry to jointly test them to provide growers with third-party data.

I think that's a good system. I think that's one that's worth looking at, because it didn't delay the introduction of new products. Canadian growers wanted access to those same corn hybrids at the same time that the guy in Michigan had them—where they didn't have a registration process. So it brought us improved products faster and made us parallel with the U.S., but it had integrated into it the ability to have performance data to make sure we were doing what we were saying we were doing.

The Chair: You're out of time, Mr. Hoback, believe it or not. Did you have a closing comment? You do have about 10 seconds left.

Mr. Randy Hoback: The last place I was going to go was the one per cent of research in China, but I guess as a closing comment I'll say that we've just seen the Canadian Wheat Board decide to spend money on lakers instead of putting it back into research. I was going to ask if you thought that was a wise use of money, considering the deficit we have in cereals as far as research is concerned and the deficit we see in the advances in growing wheat and barley compared to what we're seeing in canola or corn or other crops, but....

The Chair: Maybe you can ask them that when you're thanking them for coming here.

Voices: Oh, oh!

The Chair: Thank you very much to all our witnesses. We really appreciate it. The time is never enough, but I'm sure we know how to find you. If we have particular questions, we can do that. Thanks again.

We're going to recess for five minutes.

We'll ask the witnesses to please leave the table. We have some new witnesses coming in.

● (1030)

(Pause)

● (1045)

The Chair: Thanks, gentlemen, for being here today.

With no further ado, we will move into presentations. We'll have Mr. Rowe, president and chief executive officer of Nutrasource Diagnostics Inc., for 10 minutes or less, please.

Mr. William J. Rowe (President and Chief Executive Officer, Nutrasource Diagnostics Inc.): Thank you very much, Mr. Chair. And thanks to the panel for having me out to speak. I appreciate it.

Most of you likely have not heard of us or our company. Just to give you some brief background, at risk of sounding like an infomercial, which I don't want to do, we're a contract research organization founded in 2002. We've been federally incorporated since then. We have four divisions at our company: a human clinical trials division, a product analytics division, a human diagnostic division, and a regulatory consulting division. It's important to note that we don't do any work with pharmaceuticals. We do only human-based work on non-pharmaceutical, active ingredients used in the food, beverage, cosmetic, and natural health product sectors.

We've been involved in whole or in part with approximately 250 Health Canada-approved health claims across those categories. Sometimes we're doing the entire process for the sponsor; sometimes we're doing a small part of it. We've been involved with roughly 250 of these.

One of the key topics I was asked to speak on was whether the federal government should fund research in Canada in the agritech/agrifood sector, and how should it be funded? I'm going to speak to that today.

Interestingly, alongside this, in March 2009, Health Canada published a food health claim relationship monograph. It was intended for food and beverage companies and agriculture and agrifood companies so that they could look at how they could substantiate a health claim for their products. What we're talking about is the direct interface between a product and the consumer.

AAFC, in response to this monograph, came out with an RFP through the MERX system. There were six of these RFPs, and as part of the response to the RFPs, we were asked, as one of the bidders, to put in place our decision tree for choosing which six sectors we were going to concentrate on and how did those six sectors relate to the body of evidence in the literature.

We won five of those six RFPs. We have long since completed those. Two of those six have gone to expert panel review, and one of the two, thus far, may have some really interesting new health claims associated with the product area.

When we conduct a systematic review, what we do is look at the entire body of evidence out there. We establish parameters for the inclusion and exclusion criteria for choosing the publications that will be used to substantiate the claim. We then determine which ones will be used and why. In one particular instance, using our criteria for which publications were going to be used for the five groups we were looking at, this is what happened. After title, abstract, and full-text filtering of 14,658 unique references on this particular agrisector category, which is a significant one for the agriculture sector in Canada, we were able to use 59 publications. That was after having started with 14,000. There were 45 intervention studies, one observational study, and 13 meta-analyses, which are systematic reviews or authoritative statements. These are documents that are in the public domain.

When you look at that, there are roughly 14,600 studies that, from a Health Canada health claim substantiation perspective, are unusable, and from an AAFC perspective, based on the monograph, are unusable. So it really comes down to what the expectation of outputs are for AAFC, for Health Canada, and for the Government of Canada.

To me, in terms of how research is funded, the reason so many of these studies were rejected was that they were not powered properly. For instance, if you want to power a study properly for cholesterol lowering, you need two groups, minimally, for a double-blind, placebo-controlled trial, and you need 45 subjects. If you don't have 45 subjects, it won't produce statistical significance. You don't have a publication, and you don't have good stats in terms of proving a health claim relationship between a particular food and cholesterol lowering.

They didn't have enough subjects. They didn't have enough groups. The end point they were looking at wasn't reflected in the duration of the trial. For all these reasons, we see time and time again lots of good money chasing after flawed trial design.

● (1050)

From our perspective, as it relates to AAFC and Health Canada and growing agrifood sectors across the country, there are two key opportunities that work synergistically.

The first one is the health claim opportunity. I can tell you first-hand that when Health Canada puts a stamp on a substantiated health claim for a Canadian product that's tied to Canadian agriculture, it improves market share domestically and internationally. I've had tons of feedback from multinationals all the way down to very small companies in this regard. To me, that's a key output.

Oftentimes, taxpayers' money goes to fund trials through various mechanisms that are designed in a flawed way that won't even produce the results. Even if they're favourable or positively trending results, it won't produce the results to substantiate a claim to get Health Canada's approval. That is a big flawed area in terms of a gap analysis.

The second is the intellectual property that's produced. It's often very difficult for food and beverage companies to get intellectual property around a formula in this industry. Where they can get some IP protection is on source, which goes back to livestock and crop. Tied to their source, and unique sources, product-specific data is incredibly important for IP protection in order for them to grow their sector and market share domestically and internationally. They can do that through a health claim.

In terms of patent filings, and trademark filings around brands, this is where you think of the Millennium asparagus crop as one where you could potentially tie specific outcomes to a substantiated Canadian agrifood sector and turn that into a domestic and international growth story for that market group.

For me, as it relates to all of this, if the Government of Canada is interested in these two opportunities and interested in these outputs as a tangible outcome from funding research through Health Canada and AAFC dollars, there has to be a threshold for minimum trial design, or time and time again you end up with the scenario that I've outlined above. This isn't one that I picked out of many; this situation occurred across all five areas we looked at on behalf of AAFC.

However, if the Government of Canada is interested in basic investigative research with no parameters on trial design in terms of the commercialization pathway, very early investigative work exclusively, which is how the funding model is set up now, whether it's funded through marketing boards, growers' groups, or university-based or university quasi-based organizations and associations, then the status quo is sufficient.

If you're looking for these outputs specifically to enhance Canadian agriculture, there have to be some parameters around how these trials are designed. These are the ones that are published. Think of all the money that's gone into trials that journals have rejected because they're not properly designed. If you think of all that investment and what it's actually producing, I think the return on investment is far too low and could be a lot higher.

● (1055)

The Chair: Thank you very much, Mr. Rowe.

We now will move to the vice-president of the Ontario Fruit and Vegetable Growers' Association, Mr. John Kelly.

Dr. John Kelly (Vice-President, Erie Innovations, Ontario Fruit and Vegetable Growers' Association): Thank you, Chairman Miller.

I'm going to give you a little bit of background on myself first, because of the context of this morning's conversation. Previous to being with the Ontario Fruit and Vegetable Growers' Association, I was head of regulatory affairs and technical development for a major crop protection company. I also had responsibility, in another position, for commercialization and regulatory affairs for animal biotechnology, so if we want to get into those types of questions, we certainly can do that.

My comments today will focus on policy and on commercialization because that is where I think we need to go. The Erie innovation and commercialization initiative is a broadly supported regional effort, supported to transform some of the agricultural opportunities in southern Ontario, particularly within the sand plains where the tobacco belt is, and to try to diversify our agrifood opportunities down there. We're supported through a number of different organizations, through research and development organizations like the University of Guelph and the Vineland Research and Innovation Centre, through various governments like the adaptation council for Agriculture and Agri-Food Canada, OMAFRA , and also regional governments like Norfolk County and Oxford Country. We also have significant industry support through the Alliance of Ontario Food Processors, apple growers' and fruit and vegetable growers' associations, tobacco growers, and asparagus growers.

I do want to thank you for the opportunity to appear before you today to provide some comment on biotechnology and the importance to the sector.

My comments will be referring to biotechnology as a technology within the biospace, and this will frame how I'm going to give my comments. I'll also refer to the way I see agriculture growing and how it has new opportunities in there, which we have to take advantage of to remain competitive.

We've come out of a manufacturing age. If you think about the 1950s to the 1980s, that's when the economy was based upon big business manufacturing like autos, the auto sector, and things like that. The 1990s to 2010 was the age of the IT sector. I believe we're going to the bio sector. We're now coming into the bio generation age, so a lot of those other sectors are going to be supported by agriculture, and these things are going to have a significant and distinct importance to the Canadian economy.

We will always be the purveyor of food, and high-quality, safe food. Our challenge within the sector is to be able to compete and to be able to compete internationally with products from different sources around the world. We've had references to China earlier. We also have to compete against California. We also have to compete against Chile with these types of things.

We also know that agriculture, beyond food, will be able to support the chemical industry. It will be able to support the energy sector as well as others.

For farmers, biotechnology means more choice and it means more benefit. It can be dealing with things like disease resistance, pest control, stress tolerance—drought stress, for example, was mentioned earlier—and increased yields. We're looking at delivering health benefits. One of the challenges we've had is that many of the traits we've had have been input traits, and we're just coming into the output traits sector. I'll refer to that in a few minutes.

We have innovation in farming. Biotechnology is just another type of innovation. When we look at the future of agriculture, there are basically three main areas. One is food and health, and we have lots of examples from biotechnology where food and health is part of it. We want to be able to meet nutritional requirements. We want to be able to document food safety, but we also want to move into the functional food and nutraceutical area, and we can do these things through output traits. The golden rice that Syngenta developed is an example of that, but there are others—delayed ripening, for example, and shipping of products. We can do these things much better.

On the bio-economy side of things, we can divide that into biofuels, whether it's bioethanol from starch base or cellulosic base; biodiesel from plants, algal base, restaurant greases, or animal base; biogas, and this comes from fermentation processes whether it's from agricultural co-products.... You'll notice that manure is a co-product. It's no longer a waste product, so you want to remove that vernacular from the way you think about these things. It's the same thing for municipal waste; we can use municipal waste to generate power. Biomass is another one, and it's going to be an important one for us if we're going to generate electricity at places like Nanticoke and Lafarge. There are torrefaction technologies. These need to be developed. Syngas is another where you have gasification of biomass immediately for the production of gas.

● (1100)

We'll also be able to develop biochemicals, and we currently do have a lot of biochemicals. If you look at the foam seats that you're sitting on, I'll bet they have soybeans in them. The development of hydroxylated fatty acids from castor is another example where we can move these things forward, but we have a problem with castor in that it has a compound called ricin. Well, I was talking to Frank about this earlier. We can silence that ricin gene so it doesn't express it. That's also a genetically modified product. Polylactic acid and polyhydroxyalkanoates plastics—PHA—also have a tremendous advantage for us. And that's just on the chemical side of things.

We look at fibre for the auto sector, furniture, decking; these are also things that can be enhanced from agricultural products. So we have food and health, we have the bio-economy; and the last part where we have a real excellent opportunity is in the environment, developing the carbon economy. Canada will play a huge role in the carbon economy and we need to be able to take advantage of it. The dedicated energy crops that are out there have more roots under the ground than they have plant above the ground, and that's a carbon sink and it's a carbon capture.

Water management is also another area where we will have some leadership, whether it's through conservation, resource management, or the development of drought-tolerant plant through biotechnology. So these are things that are opportunities for us.

We have to be able to support the entrepreneur, and we have to be able to support the application of science. So when we go to commercialize these types of things, we need to have programs that will support the developing entrepreneur. A couple of examples: we have a company called Naturally Norfolk. They have new drying technologies for these foods. They've been supported provincially. We need to find other ways to support them. And an example on the opposite side would be Bick's Pickles, which was bought by a U.S. company, and that Bick's plant is now closing in Canada. So how do we avoid these types of closings?

We need to promote the commercialization of innovation within Canada. Another product, stevia, was developed by Agriculture and Agri-Food Canada, Jim Brandle in London. Well, guess where it was commercialized? In the United States. We need to be able to do these things here.

We have regulatory impacts that we need to address. We can talk about the Enviropig, if you'd like. The Enviropig is a genetically modified animal that reduces phosphate in the manure. We didn't have regulations to deal with that. That product is going to be commercialized in the United States first.

Smart regulations. I'm sure you are all familiar with Gaetan Lussier and what he did a few years ago. We need to enhance what he did. Cost of production and minimum wage standards—these all impact us even though they are not specifically biotechnology things. And we heard some discussions about the environmental regulations and setbacks this morning.

The next point is we also have to engage the consumer in biotechnology acceptance. Consumers are the driver of the economy. We have a changing demographic. We have an aging population. We also have a population that is growing in the ethnic sector. We're not supplying that ethnic sector. We should be. So when we look at the development of new products, like Asian vegetables, for example, like Indian kaddu or callaloo or red hot Chinese peppers, we should be doing those things.

We also are developing genetically modified crops that have enhanced omega-3 products. They say things in the United States about omega-3s that we can't say in Canada, and I'll give you the American Heart Association example, where they are overtly saying that we should have more omega-3s in the diet if you've had a cardiac event or a major cardiac event. So a recommendation for us, as well as Ag Canada, as well as other federal departments, including Health Canada, Environment Canada, Industry Canada, and NRCan, is to overtly support the adoption of these products when they're regulated. Not just say, yes, we think they're okay, but overtly support them and have them.

Biotechnology is good for farmers, it's good for the consumers, and it's good for the environment, in my opinion. We're seeing an increased acceptance of these products by the farming community, but we still have challenges with the consumer. And I was happy to hear the data that Mike Emes was describing this morning.

I have a couple more points. We do have to have industry at the table when we're developing these biotechnology regulations, and not just regulations but the way they're presented. We have to incent the industry to bring their processing capacity to Canada. We know we can do the extractions. We know we can do nutraceutical development. We have to find ways to actually support people to do these things.

● (1105)

We can grow the products. We have an excellent climate, particularly in southern Ontario, where there is a myriad of crops. I think there are more than 200 crops grown in southern Ontario.

How do we incent individuals and companies to get into the processing and the distribution of these products into existing markets? We already have the markets.

Policy is important. We do need to support the entrepreneur and innovation. Organizations like mine—Erie Innovation and Commercialization—and Bioenterprise, the Vineland Research and Innovation Centre, Soy 20/20, and Ontario Agri-Food Technologies need to be supported, because these are leading-edge companies that are supporting the entrepreneur and moving these things forward.

We need an expansion of the Growing Forward policy framework. Continued partnership with the Ontario government is important. We need to enhance the commercialization side of that. That will help with the biotechnology regulations. We need to develop risk management programs for crops that aren't currently grown here—for example, an insurance program for these dedicated energy crops we don't have currently.

We also need to support the growers. This could be through the offshore worker program. Currently in Ontario, the minimum wage standard has really impacted profitability and the ability of people to survive.

The last part I'll address is the importance of convergence across sectors. I'm on the board of directors of Life Sciences Ontario. On that board are people from the farm industry, the bioeconomy, the animal health business, agriculture, and environment, as well as lawyers and bankers and those types of folks. We're not just about feeding people. The food and health applications, the bioeconomy, the environmental ones...the issues that agriculture has are the same as those for most innovations. We like to invest in research and we like to see our research commercialized elsewhere. That's just the way it is.

It's difficult to build a sector based on innovation if funding doesn't exist to advance technology. When it's good research, it will find its way to the U.S., but we need to keep it here. We don't want to keep buying it back.

Harmonization in regulations has been addressed. I'm finishing—

The Chair: Yes.

Dr. John Kelly: So the message of LSO is simple: we need to work together.

Thank you.

● (1110)

The Chair: Thank you very much. Give my regards to my good friend Brian Gilroy.

Dr. John Kelly: I will.

The Chair: Mr. Rothstein, from the University of Guelph.

Dr. Steven Rothstein (Professor, Department of Molecular and Cellular Biology, University of Guelph): Thank you, Mr. Chair, and I want to thank the committee for inviting me to present to you.

I also want to just briefly mention my background because it has a significant effect on the sort of research that we do. My first job was at Ciba-Geigy in North Carolina. It's now part of Syngenta. I then came to the University of Guelph as a faculty member. I had an industrial research chair that was partly funded by Pioneer Hi-Bred. Then I left the university and went to work at Pioneer itself in Iowa where I was research director for agronomic trades. Then I came back after they were bought by Dupont. I came back to the university as a faculty member again.

Since 2003 we've had an ongoing substantial collaboration with Syngenta that's going for at least another few years, probably longer. I want to point out that this is very rare to have this type of long-term collaboration with an industrial partner. The longevity is due to a combination of factors that I want to get to later.

Obviously we'd like to think it's partly due to our competence, but it also has to do with the availability of infrastructure as well as other aspects of funding that gives us flexibility in research that I'll get to in a minute.

The two questions I was asked to address were, does the industry need government help to finance biotechnology research, development, and commercializations, and how can government help? Obviously, I only have about seven or eight more minutes, so I'll only address these from my field, which is field crop genetics and biotechnology.

I want to give a two-minute spiel about the history of research and development in this area. Industrial research organizations really only have a very large effort focused on only one crop, which is corn, for various historical and commercial reasons. Even here, they can only do a fraction of the possible research, which does open up the possibility of public sector researchers helping do some of this.

The Canadian public sector research has had very significant contributions in all areas of crop breeding and genetics. Over the last period of time it is getting more difficult to do product development. The technologies for crop genetic improvement have grown more complex and costly. At the same time, I would argue that in the public sector there's been a slow diminution of the public efforts as well as a dilution of R and D into a variety of different areas not related to food production. I can get into that if you have more questions later.

What I do want to spend a bit of time on is looking forward. I do think there are enormous opportunities to be internationally competitive in this area. I just want to highlight some of the strengths and some of the weaknesses we need to solve if we're going to do this.

What are the strengths? Generally we have good infrastructure, for the most part. A lot of that was funded by CFI and other programs that were funded by the federal government. We have good intellectual capabilities. I'd like to say that.

One of the really important things for me has been good funding of matching grants stimulating company-university interactions. This is reasonably unique to Canada when you look at the international scene. What I mean by that is if you get money from a company, then you can get matching funds either from NSERC, our national granting agency, or there are Ontario programs for us here as well.

Why is that important? Obviously it's twofold. One, the company gets a bigger bang for the buck, so it's more interested in doing that. For the individual researcher, it allows you to want to do this, because when you get company money.... I get a lot of money from Syngenta, but I use that to fund technicians to do certain things that have to do with the contract we have. What you can use the matching funds for is to hire post-docs and graduate students and do all the intellectually interesting things that go with that. So that's a really positive strength.

What are the weaknesses? I don't want to harp on this too much, but it's very clear that there's very poor funding of basic research in this area, and when you do international comparisons, that's utterly clear. That does have consequences, but I don't want to spend a lot of time on that.

What I do want to spend a bit more time on is the fact that there is no systematic, sustained, large-scale funding for required capabilities in this area. I think this is really, really important. I'm going to give you a couple of examples in other countries to just describe what I mean by this.

● (1115)

The first example is in Australia. Over the last three years they have funded three different facilities—each costing between $20 million and $30 million—to do something very close to my heart, which is to look at the effect of different crop genetics on different important traits, whether they be drought tolerance, yield, etc. One of the people I trained just left to run one of these facilities, so I know quite a bit about this.

We don't have anything in comparison in this country. I should also say that they not only fund the facility, but they fund the running of the facility in a sustained fashion, which we sometimes fail to do.

The second country...I know China was mentioned a couple of times. We started to develop substantial collaborations with people in China. They have put an enormous amount of money into looking at the genetics of their four most important crops: corn, wheat, rice, and soybeans. Now some of their research capabilities, I would say, are not up to our par, per person, but they're getting better and better all the time, and they'll be a very significant competitor—although my last point is that we can also use them as a collaborator.

And that's my final point. This sort of work is not done in one place, and we tend to have very poor funding for international collaboration. An example I'll give here is again with China. My colleague who works with me, Dr. Yong-Mei Bi, and I went to China a few times and we developed potentially a very large collaboration between the Chinese Academy of Agricultural Sciences and the University of Guelph. The odd thing is, they're the developing country and they have lots of money to send people over. They're going to send a bunch of graduate students to work here. We have a very difficult time finding the funds to send students the other way, as well as staff and faculty. In a certain sense, it's a bit embarrassing.

The final point I want to make is, in my interactions with both Syngenta and people from other companies, it's very clear that the industry is looking for others for help doing much of the early stage research and development work. I'm absolutely convinced that those companies that develop this role will reap a disproportionate percentage of the benefits, both for their farm sectors as well as in the development of commercial opportunities.

Thank you very much.

The Chair: Thank you very much, Mr. Rothstein.

We'll now move to Mr. Allan Paulson from the Advanced Foods and Materials Network.

Dr. Allan Paulson (Associate Scientific Director, Advanced Foods and Materials Network): Thank you, Mr. Chair.

I am the associate scientific director of AFM Net, which is a national network of centres of excellence. The headquarters are here in Guelph. I happen to be a university professor and researcher at Dalhousie University in Halifax. I'm also the director of the Canadian Institute of Fisheries Technology, which is a non-profit R and D facility supporting local industry in the Maritimes. I was also at one time a research scientist with Agriculture and Agri-Food Canada. That's a bit of my background.

What I want to talk about is basically the disconnect, or the two solitudes, between the research challenges faced by industry and the research challenges faced by universities and government. Then I'll talk about how we can bring these areas together to optimize our resources.

From the industry side, the research needs are usually very applied. They're short term and pragmatic—they need an answer now.

Take the food industry. It is typically low margin, high volume. This means that if you're a small or medium-sized enterprise you have limited funds for research. But even large companies have downsized or outsourced their R and D. So there isn't a lot of money in industry for research.

Also the ownership of intellectual property has to be clear. They don't necessarily have to own the IP, but they have to know who does own it.

Finally, confidentiality is essential. First off the mark usually wins.

I'll speak for university researchers, but this applies almost equally to government researchers. University researchers have conflicted demands. They have research versus teaching, pure discovery versus applied research. When you're an industry researcher, you have one focus. You're focusing on research for that company. When you're a university researcher, you have a lot of different hats that you're wearing.

For career advancement, the traditional emphasis is on discovery research rather than applied research. Collaborative research is not as highly valued when you come up for tenure or promotion. University research tends to have a longer timeline. You're expected to have research programs rather than projects per se, projects within programs but still long-term programs. Most of the research is done by graduate students and post-docs, so there's a training element involved. It's difficult to tell a grad student to work on a project and present an answer in a month.

The other thing is that the focus is on publications, not patents. For tenure and promotion, they'll count the publications, but patents don't get the same value, which I think is completely backward. Grad student theses also take time to publish, so it's this whole publish or perish model for profs.

Finally, the IP can be problematic—it's extremely important in industry. Many, if not most, researchers aren't really that interested in IP. A lot of them wouldn't know IP if they were to stumble over it. The value of the IP isn't recognized. The protection of IP is extremely spotty. Most labs do not have rigorous protocols for making sure that everything is documented in lab books. Also, different universities have different policies. A company dealing with universities is not always going to have the same playing field.

Overlaying all this are other challenges. Canada is a vast country. We have a small population. We have scattered expertise and resources. Our research culture is not geared to collaborative, transformative research. The food industry is fragmented nationally, but so is the research community. We have a lot of really good research going on, but it is scattered and not linked.

● (1120)

The upshot of this is that both sides are frustrated. What this means is that there's a loss of opportunities. Canada is great at fundamental research but very poor at application and commercialization of research.

Getting down to the opportunity, so far we haven't done a great job of linking the industry and the different research capabilities. At the Advanced Foods and Materials Network, a nationwide research organization put together to link academia with industry, government, non-government organizations, and international organizations, the infrastructure has been developed. We have a wealth of experience at putting together research teams that are aimed at transformative research and commercialization of research, as well as training highly qualified personnel who are going to be the leaders of tomorrow.

The funding for this network is going to cease as of March 31 of this year. Having this infrastructure in place, having the expertise and experience in place, is an opportunity to take this and overlay it as a research manager for the disparate sections across Canada in both industry and academia. It's a central portal to put together industry and researchers, NGOs, etc.

I'll stop there and answer any questions.

● (1125)

The Chair: Thank you very much.

We'll now move into questions.

[*Translation*]

Mr. André Bellavance: A point of order, Mr. Chair.

The Chair: A point of order?

Mr. André Bellavance: Very briefly, Mr. Chair.

The clerk has circulated Mr. Rowe's document. You know the committee rule about French and English, the two official languages. The French document is completely unintelligible. So I am asking the clerk not to circulate a document when it is like that. It is not just a matter of two or three mistakes in the French. The document was probably translated by computer and, for me, it might as well be in Chinese. My anglophone colleagues can understand what they have been given, but I can't. I want to remind witnesses that they can submit their documents to the clerk in the language of their choice, English or French, and we can have them translated. The document I'm talking about is not in French, Mr. Chair.

[*English*]

The Chair: Obviously my French isn't very good. I looked at it. It is in French. If there's a problem with the quality of the French, I suggest you take that up with—

[*Translation*]

Mr. André Bellavance: It is not a matter of quality. The document is made up of a series of French words placed one after another, but it is completely unintelligible. That is what I want to tell you. It has to be clear.

[*English*]

The Chair: Maybe “quality” was the wrong word. Again, I think you've made your point with the presenters.

Mr. Rowe.

Mr. William J. Rowe: For Mr. Bellevance's understanding, it was not done by machine. It was done by one of my staff who is certified in bilingualism. I apologize.

The Chair: It was done with good intentions.

Mr. William J. Rowe: It was definitely done with good intentions. I apologize for whatever communication—

[*Translation*]

Mr. André Bellavance: I do not want to get into a long debate about this, but your employee...

[*English*]

The Chair: Neither do I.

[*Translation*]

Mr. André Bellavance: Yes, but the rule is clear. This document should not have been circulated. That is all I mean. I don't want to hear about good intentions.

[*English*]

The Chair: The rules are that it be in both languages, and in my opinion, from what I'm hearing, the French is not good. Mr. Rowe has apologized. I don't know what else we can do, other than all learn from it.

Mr. Valeriote, seven minutes.

Mr. Francis Valeriote: Gentlemen, first of all, I want to thank you for taking the time to come to us today to share your thoughts on issues the committee is dealing with in biotechnology. Of course, our impulse is to assume that transgenics is the issue, but it obviously isn't; it is only part of a much broader biotech industry.

John, you really brought that home in discussing biofuels, the environment, plastics, and any number of other things. The committee has had an opportunity to see evidence of all of that this week, having been in Alberta and Saskatchewan.

We talked about transgenics earlier this morning, and at this juncture we're talking about commercialization. I agree, and it's something I think we're all noticing, that we have great innovation. We're exporting all our great innovation like we're exporting our natural resources.

There's a lot of infrastructure out there right now to help with commercialization, such as, AFMNet. There is MARS in Toronto. We're trying to develop a mini-MARS here in Guelph. There's one in Ottawa.

I'm wondering if you think the government should direct greater energy and resources, not just financial resources but create a department of commercialization to help people adapt, identify where the infrastructure is, support it where it exists, and maybe replicate it where it doesn't exist. Only through that effort do I think the minds, the money, and the people with the entrepreneurial skills will actually come together and keep all of our wonderful innovation from being exported.

Steven, you mentioned a report, which you said you wouldn't refer to at length, about how poor our funding is in basic research compared to other countries. You seemed to have some statistics to back that up. Could you provide that to the clerk at another point in time?

Dr. Steven Rothstein: I don't have a report, but I could certainly get you the statistics.

● (1130)

Mr. Francis Valeriote: You could get us the statistics.

When we were at Olds College yesterday, I heard them say we're losing a lot of our researchers. They're not staying in Canada. We thought something quite different earlier, that our researchers were staying.

I'd like you to address the commercialization question and what's needed to hold on to our researchers. If there's time, I'd like to speak to you specifically about AFMNet's loss of funding.

Dr. John Kelly: I would be happy to talk about that.

Do we need a department of commercialization? I think we have much better success when we put commercialization into the hands of people who can actually commercialize. That's why I'm supportive of organizations like BioEnterprise, for example. Their mandate is to help organizations commercialize. They also have the ability to work with a lot of people within the sector.

We need to find ways to support those who have the experience in doing commercialization. It may not be another government department, but certainly working within the current infrastructure of Industry Canada and working with Agriculture and Agri-Food Canada, in particular, because that's what BioEnterprise's mandate is, will be very important.

I get a little worried that by creating another department it just becomes another organization that is doing what is currently being done but is not being done effectively. We know that in Canada we are really poor at commercialization. The U of T business school studies have shown that. I would suggest that we need to fund organizations that actually are on the ground doing the commercialization.

With regard to losing researchers, we're in exactly the same boat in the fruit and vegetable sector for a different reason. Researchers are hitting retirement age. That's a key issue for us because we don't have a plan for what's going to happen in the future. When Adam Dale and Alan McKeown retire from the Simcoe Research Station, who's going to do the berry research and some of the small crop genomics-type research that we need to have done?

Mr. Francis Valeriote: Steven.

Dr. Steven Rothstein: I'd like to address a couple of things. On the commercialization front, there are two things I want to say. With regard to my own personal area of research, what we really need is to be really, really good at some things that we're not quite good enough at if we want to attract companies and additional commercialization. I couldn't emphasize that too much. You can just look at the high-tech industries, where Waterloo is really good at certain things, and you see the commercialization that comes from that. I don't want to get into that in more detail at this point, but I'd be happy to if someone has the question.

The second thing is, I've been involved with some small companies, and in comparison with our neighbours to the south, we're not very good at supporting small business with regard to research. I couldn't emphasize enough how important the SBIR—small business innovation research—grants are in the U.S., as opposed to the way we do things here, which always involves matching grants and a lot of bureaucracy. There, people write grants, they get the funding, they start. Here, you need to get some matching money and you have a bureaucrat following you every month asking you where you've spent the money. I think that's a big difference.

With regard to maintaining our researchers here, we clearly have some problems right now. The university funding is not growing. That means we're not hiring new faculty members. We haven't hired for a few years. We won't hire for another three or four years. That's not unique to us. On top of that, the sorts of opportunities we could create, if we did get really good at some things and attracted commercial ventures here, would have an enormous impact, I think.

That's all I really want to say, I guess.

Mr. Francis Valeriote: If I could, Allan, AFMNet has lost its funding, and then shortly thereafter we learned that NSERC has withdrawn from its priorities—food research—which is of grave concern to a lot of people. I've had people write to me—Maple Leaf, for instance. Just two days ago, Dr. Jill Hobbs and Mark Wartman in Saskatchewan expressed grave concern about AFMNet.

Can you tell us what needs to be done? If NSERC won't fund you, and you need it, tell us why you need it, the benefit of it, and what we might do to help you.

● (1135)

Dr. Allan Paulson: AFMNet as an entity right now functions both as a facilitator, a trainer of highly qualified people, and as a granting agency. Now, the way I see AFMNet's most important role isn't necessarily as a granting agency, although that is something that is extremely important because of the cutback in NSERC funds, but being able to facilitate the putting together of researchers, bridging that death valley between the laboratory bench and being able to take a product and commercialize it....

The biggest loss for me, though, is in HQP training, training students, training technicians and post-doctorals to be entrepreneurs. We have a strong multi-disciplinary, multi-sectoral training program. Eighty per cent of the research funding to AFMNet goes to support graduate students, undergraduates, post-doctorals, etc. We give them a training opportunity that is far and away more diverse, more varied than any other graduate student is going to get. This opportunity is going to be lost.

Two weeks ago we had a professional development school, which we have annually, and as usual we had rave reviews. We had entrepreneurs. We had people there basically asking how to prepare resumés. It's things like this that these students get that they won't get if they're chained to a laboratory bench, and it's going to be gone. So there must be some way in order to continue.

The Chair: Thank you.

Mr. Hoback, seven minutes.

Mr. Randy Hoback: Thank you, Chair, and thank you, gentlemen, for coming here this morning. It's great to listen to the people in the field, and it's always great to get out of Ottawa, even to come to Guelph. It's great.

I think I'm going to continue down the road that Frank started on, on what the University of Saskatchewan called “the valley of death”. Their interpretation of the valley of death was when you had an idea and you actually were able to develop it to a certain phase, and then you hit the valley of death when you went to commercialize it.

John, do you have any ideas on how we can bridge that valley of death?

Dr. John Kelly: It comes when somebody has proof of concept. They know it works, but they cannot get to the manufacturing phase. Typically you have university and government funding to get to that proof-of-concept stage, and then you have to try to attract some funding from the private capital market, the angel markets, or the venture markets.

In agriculture, we have a real dearth of financiers. We have people who will take companies, if they have $2 million in sales, and will help grow them. But we don't typically have any investors for that valley of death.

One thing the government could do would be to set up a matching grant fund to support these types of things, to de-risk some of the technologies that are out there.

A lot of the technologies don't have the interest of the venture players, because the venture players are looking for the home runs. A lot of the technology in agriculture will be profitable, but they're not home runs. That's another part of what we do.

Will's company grew with support through the university and the SBIR program, which is something we should think about embracing.

Mr. Randy Hoback: When we look at the infrastructure for the biotech sector, one of the comments we heard in Saskatoon was that we can develop the information, we can develop the product, but for some reason we always export the manufacturing.

Any ideas on how we can curve that so that the manufacturing is also happening here, so that we can see a complete system here in Canada instead of manufacturing being exported off to the U.S. or somewhere else?

● (1140)

Dr. John Kelly: Part of it is money and having the ability to finance from that valley of death on. I know that Agriculture and Agri-food Canada tried to get some Canadian people to take a chance on this. They weren't successful. I don't know the reasons for the lack of success in finding investors, but they were able to find those investors easier in the U.S.

Part of what we need to do is to make it easier, and there has to be some incentive for investors to look at these early-stage technologies.

The other part is that we need to educate the capital sector on what the opportunities are. They know the farmer model and they know the IT model. Most Ontario people I talk to, when I ask them what the largest sector in Ontario is, will say it's auto, IT, or pharma. I have to tell them they're wrong—it's agriculture first, then those other three. Most people don't know that.

Mr. Randy Hoback: With respect to infrastructure for the biotech sector, it's nice that this conversation didn't go to GMO. When we do this study, it automatically goes straight to GMO. Bioscience is a lot more than just GMO.

What do we need to do to build the infrastructure necessary to make Canada the major player in biosciences and biotechnology?

We talked about what's happening in China and Australia, the investment that's going on there. Should we be looking at doing more producer checks? Should we be looking at other ideas like that?

Dr. Steven Rothstein: I'll just talk about my area, because it's a very broad question. In my area, the key thing that people need to be able to understand is how different genetics, whether it's GMO or base genetics, have an effect on what the plant looks like, the traits the plant has. That's the thing that's really difficult to do, and companies are definitely looking for opportunities not to have to do as much of that as they are.

For example, if we were really good at that and we set up a significant organization to do it, then all of a sudden all the things that come from that would come to you. For example, I work on agronomic traits, basically yield and the effect of different stresses on yield. But it wouldn't just be that. It could be how to use crops for other types of traits, or how to use them for producing fuel. You need to have a system in place where you're really good at that core, a system that allows people to come in with whatever ideas they have, whether they're from the public sector or the private sector.

I think there's an opportunity there. No one in the world is doing that at the level it needs to be done to get company research organizations interested in contracting that out. That's just one example.

Mr. William J. Rowe: I was born and raised in Kitchener-Waterloo. I'm a University of Waterloo graduate. I remember when Phillip Street was farmers' fields. Within a span of five to 10 years, the University of Waterloo just made a stand and declared themselves the MIT of Canada. From that, RIM, Sybase, Open Text, MKS, and Virtek—I could list a bunch of others—just blossomed. A lot of money went into that, and now you see the return on investment coming full circle.

From that standpoint, I think if you're going to do this properly, and along the lines of what these gentlemen are saying as well, we—the collective "we" of industry, academia, and government at all levels—have to declare ourselves and pick the geography. We have to say that we're going to put big money into this sector and that this is the commercialization pathway, soup to nuts, to get from idea to a product on the shelf. We need to have all the stakeholders involved and have a process that meets certain minimum criteria to achieve it. Then you start getting a cluster that's spitting out commercial opportunities.

In a previous life, I worked at the University of Guelph in the area of selling, if you will, R and D contracts for science and engineering at Guelph to the private sector. What I often found was that faculty in science and engineering often didn't know they had a product when they most definitely had one. The way they're wired, typically—not all the time, of course—is to chase the same thing over and over, the same concepts over and over, and publish, publish, publish.

But while they're doing that, in that activity of sort of chasing their tail in their quest for knowledge, they're spinning off all these concepts, ideas, and products, and they often don't realize that it's okay to go out with this product or that product, that this is worth commercialization. You can always have a next generation or a version B or a new and improved product three or four years from now when you answer the next question in your mind's way of thinking.

A lot of times we have excellent technology or seedlings of excellent potential product sitting on university shelves across the country. That isn't seeing the light of day. It's not getting into a commercialization pipeline that takes somebody through. In fairness, a lot of faculty in the science and engineering area are either not wired that way or not motivated or incentivized that way. They don't get past and they don't understand the commercialization piece. They do need help. A lot of them will admit that fully; it's not something they're bashful about. They know they need help and oftentimes they simply don't know where to turn.

If that were more obvious and there were perhaps commercialization centres that were better structured and better funded...I'm more for gathering your strength in two or three things than kind of half funding everything all over the place, because I think that's the stronger approach to tangible outcomes.

● (1145)

The Chair: Thank you.

There may be time at the end, Randy, if you have something else.

Mr. Easter, five minutes.

Hon. Wayne Easter: Thanks, folks.

I'm going to go from the broad areas to some of the smaller areas that maybe we need to make some recommendations on.

John, you mentioned developing risk management programs for energy crops. We have some problems with current risk management programs in agriculture specifically. Are you suggesting that there needs to be something different from what applies to agriculture generally for energy crops?

Dr. John Kelly: No. It's for crops that have no history of use, right?

Hon. Wayne Easter: Okay.

Dr. John Kelly: You can pick the energy crops. Miscanthus is not native here. How do we de-risk the timeframe required for growers to put miscanthus in?

Hon. Wayne Easter: Okay. That clarifies it. I agree with you 100%. It's something that we need to...we've seen some of that in Saskatoon.

The other area that a couple of you mentioned was the whole area of losing researchers. We have the same problem. You mentioned berry researchers. There's the same problem in B.C. We have the same problem in Atlantic Canada. As Agriculture Canada researchers retire, they are not being replaced. It's a serious issue.

One of the areas they're recommending, perhaps more so in the Saskatoon area, is that we really need to basically re-enhance our public research initiative in discovery research, because I think we're in a different time now than we used to be. My concern is that private companies are attracting the best of the best because they're paying more. The incentives are there.

It's going to be hard to get back to a system where we attract the best of the best to public research, the discovery research area. Are you folks suggesting that we need to up the ante, I guess, in terms of public research that involves the Government of Canada?

Dr. Steven Rothstein: If I can parse it out, there are two things you're referring to. One is the non-replacement of key researchers, and that can be in either the government sector or in university. I will refer to the university environment because that's what I know.

When I was first at Guelph, for the 10 years between 1988 and 1998, we didn't recruit anybody. Then there was a little period of time when there was some recruitment and now we're back to not recruiting. That's created an enormous problem with regard to developing innovation across the country. We're not unique in that. I don't have a solution for that because it's all coming down to finances, clearly.

As to whether it's a good thing, I would argue it's not a good thing at all.

● (1150)

Hon. Wayne Easter: I don't want to interrupt you, Steven, but on the problem of finance, there is no question that the data we have from Statistics Canada, the Canada Foundation for Innovation, from everywhere, shows that a dollar invested in research returns more dollars than a dollar invested anywhere else.

Larry will cut me off in a minute, but I just want to add two other questions that I think we need answers on. Maybe both of you could answer.

Steven, you mentioned the difficulty with grant applications, all those bureaucrats following you around. I think we're in a time now where we basically allow the requirements for perfection to get in the way of doing the right thing. Governments are so concerned whether they're going to end up in the press over spending $10 in the wrong place, but they'll spend $1,000 on bureaucratic delays. It makes no sense to me. I'd like you to expand on that.

What I hear from researchers in my own area is that they're spending 40% of their research time chasing money when they should be spending their valuable time doing what they were trained, educated, and have the expertise to do. That's the problem.

My second to last question is for Mr. Rowe.

You talked about the trials in design. I was thinking that as a result of not doing proper trials, or not being able to get the people, or whatever the reason is behind it, we're actually losing the original investment that was made in that research area.

Could you answer those?

Mr. William J. Rowe: What was the last part of your question?

Hon. Wayne Easter: You mentioned not having the number of people to do the proper trials. I see that we're losing the original development of the product, or the benefit of that becoming known in a database analysis way. In effect, we have lost a lot of the original investment that we made in that original research.

Mr. William J. Rowe: It really comes down to the outputs you're looking for. If you're looking to fund investigational research that is far removed from commercialization, so that it's not done in support of a health claim, then that money perhaps did have a higher return on investment.

However, if your outputs are a health claim, which is really what a lot of the food and beverage companies and even growers groups are ultimately looking for in their sector, because that's what gives them commercial advantage domestically and internationally, then these trials have not been designed in the appropriate way.

It's not that these trials are “bad trials”, but if the output is health claim substantiation as defined by Health Canada, the FDA, USDA, or the EU, then they don't meet the minimum threshold is what I'm getting at. It really comes down to the outputs.

I have one other quick comment on funding, which hasn't been discussed today. The SR and ED, the scientific research and experimental development tax credit has been in existence for decades, regardless of which party has held power in Ottawa. It's been in existence for quite some time, and it grows every year. For my company, it's been a phenomenal tool. It has a very low burden of proof compared to an NSERC or IRAP situation. I have a huge competitive advantage over, say, the University of Guelph in hiring scientific staff because of the SR and ED tax credit. That's a matter of public knowledge. There's no secret there.

With respect to the SR and ED program, the federal government has done a wonderful job for the private sector, whether you're a service provider like us, a research company, or a company with a research department like Syngenta, in setting up a program that allows you to subsidize salaries through this tax credit.

● (1155)

The Chair: Dr. Rothstein, briefly.

Dr. Steven Rothstein: I'll be very brief.

I agree with John on the tax credit, by the way.

On the point of bureaucracy, I do have a number of grants and contracts. Over the years I'd typically have somewhere between nine and 14 reports a year to write to satisfy different things, and I've had to hire a person to do that. I can't do that myself. It's the life we live now with auditing and everything else.

You asked about writing the grants. I look at that as my job, to get money for my group. I spend a lot of time doing it. I don't see any way around that.

The Chair: Mr. Shipley.

Mr. Bev Shipley: Thank you, Mr. Chair, and thank you to our witnesses.

Bill, you raised something that's well known. For example, the University of Waterloo and MIT. They were going to be the champion. This is when they made that decision. Then it would seem the private sector said they were with you, and this is what they could do.

I'm sure it was much more complicated than that. Who made that decision, and how did that decision get made by an educational institution? Was that strictly on their own? They made that decision to say this is how they're going to bring in partners, this is how they're going to do the research, and this is how they're going to marry together....

I'll talk a little bit, Allan, about your comments on industry and universities.

Mr. William J. Rowe: Waterloo historically had a lot of strength in engineering and computer science. They helped grow those sectors, academically, technically.

You really have to go back to Dr. Hagey, one of the original people involved. As they grouped, they made a concerted effort to declare themselves in this category; they were going to lead. At the time they were also the pioneers of the co-op model, which many universities, all universities pretty much, as well as community colleges, now follow.

I think there was a bit of good timing, a bit of luck, but there came a point when the university administration at Waterloo said they were going to draw a line in the sand. This is who they were going to be. They were going to declare themselves. They were going to align themselves along this pathway.

They've never looked back. That was probably made sometime in the late 1960s, early 1970s. I think President Burt Matthews at Waterloo at the time was also a key driver of that, as well as all the subsequent presidents. The most recent president, David Johnston, was part of that as well.

Mr. Bev Shipley: Steven, in terms of the University of Guelph, maybe agriculture, biotechnology isn't quite as sexy as having the MIT from Waterloo.... I don't know.

In terms of being able to move ahead, is that a conscious decision? Is the University of Guelph recognized across Canada as an agriculture university? Is that something you could see to grasp, that you're on the cusp of something revolutionary? It's going....

We talked earlier with our witnesses about this being the largest industry in its value to our economy, quite honestly, not only in Ontario but in Canada.

You're going to grab this thing and become the university, not just in Ontario but in Saskatoon and wherever. This is what you're going to do. You're going to be the champions.

Is that something you would ever see being viable? I'm listening to Allan talk about industry and university: one wants the commercialization and the other is about programming. It's disjointed.

I'd like comments from both of you on that. I believe somebody has to champion this, and then how do we fit in as a government?

Dr. Steven Rothstein: You're putting me on the spot with that one. The question is, should or could the university declare they're going to be the champion?

I think it goes to what Bill was saying before; it is a decision that you can make. You can put your resources there. You can put your intellectual efforts there.

Unfortunately, and this is just the way it goes, it has drifted over the last period of time, partly because there aren't as many students going into agriculture any more and that drives some of the equation. The funding models don't work exactly the same as they used to.

If you're asking me whether it should be done, I absolutely think it should. I think it should be done here. I think it could be done as well in Saskatoon. There may be other universities where it should be done.

I think it takes leadership and funds. I don't know what else to say about that.

● (1200)

Dr. Allan Paulson: I agree that it definitely should be done. Enrolment in faculties of agriculture is declining across the country, but I think it is because potential students don't see it as being sexy. They see it as farming when in fact the agrifood industry now is a long way from farming.

Somehow, if food, agriculture, agrifood were on the national research priority list, I think that would attract more researchers, more funding, and more businesses to the sector.

Mr. Bev Shipley: Was the MIT thing sort of a principle on the government's radar? Do you think that is what drove it in Waterloo? Or was it sort of an initiative that “this is what we've taken as a leadership, and we need to bring in investment, outside of public dollars or taxpayer dollars”?

I am trying to grasp how we do it. I'm not pointing fingers at anyone, because it has to happen. We have fewer people in agriculture. We have a large industry, which means it's becoming much more specialized. People who are in it are extraordinary business people. They're extraordinary innovators. They adapt the research to what meets their needs, not someone else's needs. That works for innovation too.

I'm just trying to grasp how we move there and what we can do to help. I'm open.

John, you look as though you want to say something.

Dr. John Kelly: I do. It's interesting that everybody is mentioning Saskatoon and Guelph. What you're talking about is cluster developments, really.

The cluster in Saskatoon was developed about 30 years ago with defined Saskatchewan government direction. They said “We are going to be the crop biotech leaders globally.” That's what they wanted to be known as.

Their cluster was financed. So if you look at all the companies around the University of Saskatchewan in Saskatoon, there's a pile of them.

If you look at what's happened in Guelph, it is also an agriculture cluster. It has developed a little bit differently, more organically, but the key driver of the cluster here was the location of the provincial ministry of agriculture. If you look across the road in Research Park, you'll see Syngenta, Monsanto, Elanco, Bayer, the Canadian Animal Health Institute, Grain Farmers of Ontario. They're all there. I can recall, 12 years ago, walking across a soybean field where that is. That is an organically grown cluster.

What can the government do? They can help locate facilities in one particular area and provide the infrastructure, and things will grow around it. If you follow cluster theory, competitors will locate next to each other because they know it's important. The same thing has happened in Waterloo.

The Chair: Thank you. We never seem to—

Mr. Francis Valeriote: Can I just respond to something Bev asked? I think I can offer some information in answer to his question about Guelph declaring itself.

The Chair: Okay, go ahead, briefly.

Mr. Francis Valeriote: The mayor in fact developed a task force over a year ago, which brought a number of minds together, including the MPP, the MP—me—and, from the University of Guelph, Dr. Kevin Hall, who is vice-president of research. It's being investigated at this moment whether we will declare ourselves the agritech, biotech, environmental tech, food technology centre in Canada.

● (1205)

Mr. Bev Shipley: That's good.

The Chair: Gentlemen, thanks a lot. There's never enough time, and we are out of it.

We do appreciate your involvement here today. If there's something that you see as pertinent as a follow-up that we should know about as far as information goes, please pass it on to the committee. It will be translated into the two official languages, and it'll go from there.

Dr. Allan Paulson: Can I make one comment? I never had a chance to squeeze it in. It will take only a few seconds.

The Chair: Yes, certainly.

Dr. Allan Paulson: Regarding Bill's comment about clinical trials, AFMNet in fact does fund a coordinator for a multi-centred clinical trial facility that's designed to address exactly your concerns. Right now it consists of, I believe, four facilities. They have exactly the same protocols. They're coordinated out of Laval University, and that's another thing that's going to be lost.

The Chair: Thank you very much.

Thanks again, gentlemen.

We now adjourn.

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