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Chair

Mr. Pat Finnigan

Standing Committee on Agriculture and Agri-Food

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● (1530)

[*Translation*]

The Chair (Mr. Pat Finnigan (Miramichi—Grand Lake, Lib.)): Welcome, everyone.

Today, pursuant to Standing Order 108(2), we begin our study of climate change and water and soil conservation issues.

We will be hearing from the Canadian Roundtable for Sustainable Crops today; it is represented by its Executive Director, Susie Miller.

[*English*]

Welcome, Ms. Miller.

From CropLife Canada, we have Dennis Prouse, vice-president, government affairs.

[*Translation*]

He is accompanied by Ian Affleck, the Executive Director responsible for plant biotechnology.

We will start with the presentations, which can last up to 10 minutes each.

[*English*]

Ms. Miller, go ahead for up to 10 minutes. Thank you.

Ms. Susie Miller (Executive Director, Canadian Roundtable for Sustainable Crops): Mr. Chair, thank you for the invitation to appear before you today.

The Canadian Roundtable for Sustainable Crops was formed in 2013 specifically as a means to proactively advance sustainability for the grains industry in Canada.

The CRSC, which is what we call it for short, is member-based and has a broad scope of members. These include grain growers, supply chain organizations, grain handlers, food processors, food service companies, and environmental and sustainability organizations.

Currently, we have about 50 members from across Canada. Government has no members—we exclude them from membership but they are invited to participate in our meetings and they contribute to technical committee discussions.

The CRSC mission drives our work and our mission is as follows: to create value for all members of Canada's grains sector by providing a national forum for advancing, reporting on, and communicating the sustainability of Canadian grain production.

To this end, the Canadian grain sector, through the CRSC, is driving an industry-led initiative to gather existing information, to conduct original research, and to make publicly available comprehensive and national data about the sustainability of grain production in Canada. We intend to maintain this information online and keep the information as up to date as possible, enabling all interested parties to understand sustainable grain production and to see how it changes over time.

The need for this initiative was clear. There are numerous sustainability certification standards globally, some of them company-specific, but they all focus on the same issues.

The CRSC has determined which issues are important from across the major standards with the goal of allowing any stakeholder, regardless of which standard they use, to find the information they need on the sustainability of our production.

We believe this will serve a twofold objective. First, it will enable food manufacturers and food-service customers to clearly and credibly tell consumers the story of the sustainable production of the grain products they make. Second, it will help Canadian grain and oilseed producers and exporters to maintain market access for those economies or customers that require macro-level sustainability information as part of their regulations or procurement policies.

To accomplish this, we have first engaged with the membership itself, and then outside to buyers, customers, and the general public. This dialogue is critical to establishing a congruent approach among our members, many of whom have active programs to enhance sustainability. The CRSC offers them the opportunity to coordinate and develop synergistic approaches among these various organizations and initiatives.

Given that the CRSC has members that produce grain as well as members that buy and consume grain products, the CRSC assists in the understanding of the expectations of customers and societies, including environmental organizations. This understanding of the expectations of consumers and society led us to the second focus of our work, which is on the establishment of research priorities and the undertaking of research to fill knowledge gaps.

To ensure that information meets the needs of our stakeholders, it must be science-based and credible. In the last year, the CRSC has invested in researching the carbon life-cycle footprint of ten crops in major grain-producing provinces. As well, we conducted a survey of producer practices that relate to sustainability criteria.

The researching and collection of credible and relevant data is not in itself valuable without a mechanism to effectively communicate that information to those who want it or require it. To do this, we embarked on a major project to build our online grain-sustainability metrics platform.

As mentioned earlier, the platform will provide relevant and credible science-based data about the sustainability performance of Canadian grain producers. Although the majority of the information is about environmental sustainability, we're also providing information on social responsibility, which is about workers in the community as well as the economic viability of the industry as all three are important to our customers and consumers. We are currently in the latter stages of development and plan to have this platform launched in early 2018.

● (1535)

To do this, we are using a multitude of data sources. One source of particular importance is the work that Agriculture and Agri-Food Canada and Environment and Climate Change Canada undertake on environmental indicators.

In addition, we rely on results from a number of Statistics Canada surveys, such as the agriculture census, the farm environmental management survey, and the water use survey. This survey information is complemented by our own data, which I talked about earlier, as well as that generated by the Canadian Field Print Initiative, which is another sustainability initiative undertaken by the grains industry.

I would also mention that we have been able to undertake this because of the contribution of the Government of Canada through Agriculture and Agri-Food Canada's programs, which provide funding that's matched by our members.

In closing, I would like to share with you the results of the research that we've conducted into the expectations of markets and civil society regarding environmental sustainability. As expected, there are definite expectations that producers handle agrochemicals, fertilizer, and manure in such a manner that they do not negatively impact water quality, and that producers maintain the productivity of soils. In addition, markets and civil society also have expectations of the agriculture industry in general for greenhouse gas reduction, the preservation and enhancement of wildlife habitat, the maintenance of sensitive areas, and the management of waste and pollution.

There is also an understanding within these groups that are looking for sustainable performance that ideal results will not be achieved immediately, but that there's continuous improvement over time.

Again, thank you for your interest.

The Chair: Thank you very much, Ms. Miller.

Now we have CropLife.

I don't know if you want to split your time , but you have up to 10 minutes.

Mr. Dennis Prouse (Vice-President, Government Affairs, CropLife Canada): Thank you, Mr. Chair. We appreciate the invitation today. With me is my colleague Ian Affleck, our executive director of plant biotechnology for CropLife Canada.

Although many aspects of the plant science industry have evolved since we were first established in 1952, our main purpose remains the same: providing tools to help farmers be more productive and more sustainable. Our members also develop products for use in a wide range of non-agricultural settings, including urban green spaces, public health settings, and transportation corridors.

No one has to tell Canadian farmers about the impacts of climate change because they've been dealing with them for some time. Our challenge now as an industry is to find a way to help Canadian farmers be more productive on less land and in a more sustainable way than ever before. Fortunately, Canadian farmers are some of the most rapid adaptors of new technology in the world. What we will talk about today is what Canadian farmers are doing now to improve sustainability and address climate change and how we can do even more in the future.

You will often hear us speaking about our industry's technologies. Most people don't think of agriculture in that way, but the pesticides that protect crops and the plant biotechnology that creates hardier and healthier crops represent leading-edge science that makes our lives better. In addition to protecting crops, pesticides and biotech crops also have an impressive story to tell about how they help protect the environment by helping farmers use less land to grow more food, preserve biodiversity, tackle climate change, and conserve natural resources.

Thanks to plant science technologies, Canadian farmers grow more crops on the very best of our country's farmland, leaving marginal land alone. Doing this saves 35 million acres of forest, native grass, and wetlands from being used for agriculture, thus protecting biodiversity by safeguarding habitats.

Far from harming biodiversity, modern agriculture is in fact a crucial part of protecting it. Biotech crops and pesticides help farmers better control pests in their fields. Before these technologies existed, farmers had to till to get rid of weeds. For those who may not be familiar with tillage, it's the practice of plowing a field to remove weeds. This is hard on the soil as it breaks down organic matter and reduces the soil's ability to retain moisture. Tillage was a big part of why the dirty thirties were so devastating. Because the soil was fragile from tilling, the dry and windy conditions resulted in precious topsoil being blown away.

That has changed as a result of farmers using pesticides and biotechnology in combination. Because farmers can apply herbicide, they do not need to till for weeds. As a result of advances in agricultural technology, farmers can also leave stubble to decompose right in the field, adding organic matter back into the topsoil and improving soil consistency. As a result, soil is less susceptible to wind and water erosion.

Reduced land use, less tillage and summer fallow, and eliminating equipment passes reduce greenhouse gas emissions by 29 million tonnes a year in Canada. Making fewer passes over fields with equipment reduces diesel fuel use by up to 194 million litres a year in Canada alone. The success of biotechnology since its introduction is significant, and it's an important tool in the fight against climate change.

We constantly challenge ourselves as a industry, however, to do even more to give farmers access to technology that makes the world a better place. One of the challenges our industry continues to face, both in Canada and around the globe, is a regulatory system that is slow to improve new traits.

In spite of the annual growth in biotech crop adoption, we have not seen the predicted introduction of new crops. Eighty per cent are still in the four major field crops. What's more, the growth we had expected to see in public sector-developed products has not materialized. Seventy-five per cent of commercialized products are still coming from the leading private sector technology developers.

So why are we not seeing the new and innovative products in both new seeds and crop protection products to improve sustainability yields even further? The reality is that the regulatory system is failing to deliver innovation to farmers.

With regard to the timeline of commercialization, we've seen that the most time-consuming part of getting a biotech trait to market is actually outside of the developer's control. The cost and time involved in regulatory science and registration have increased 50% in the last decade.

We have seen some new consumer traits approved in Canada. The Arctic apple, produced by Okanagan Speciality Fruits, is the apple that doesn't brown after slicing. It should start being commercially available next year, and the possibility for cutting down food waste is exciting. The same holds true for any potatoes produced by J.R. Simplot, which provide protection against potato bruising and browning.

This is just the beginning. There are new traits in the pipeline, and they will provide improved disease, insect, and weed control. Others are designed to improve drought tolerance, saline tolerance, and nitrogen-use efficiency. There are next-generation yield, field efficiency, and ethanol traits and consumer benefits such as healthy edible oils and enhanced nutrition. The benefits of enhanced nutrition are important in the developing world, where the impact of climate change will be felt particularly hard.

● (1540)

The regulatory system is limiting the ability of private and public sector developers to get new traits and crops to farmers. While private sector developers can shoulder these time and cost burdens, it's very difficult for public sector developers to see their products through all the way to commercialization.

It's worth noting that we're talking about technologies that, in their over two-decade history, have an unblemished safety record. There is a global scientific consensus on the safety of biotech crops, and neither Canada nor any other regulatory agency has encountered one documented case of harm. Biotech crops are not a health and safety concern for Canadians, nor are they a regulatory concern.

In conclusion, Mr. Chair, we're very proud of the role that our industry has played in making Canadian agriculture more productive and more sustainable than ever. Modern agriculture is very much part of the solution on climate change, both in Canada and around the world. These contributions would be greatly enhanced should Canada make a sustained effort to reform its regulatory system. Canadian farmers are eager and ready adapters of new technology. It makes sense to find a faster, more effective way to deliver them that technology, while making Canada a global centre for investment and innovation in modern agriculture. We urge the Government of Canada to help make this vision a reality.

Thank you, Mr. Chair. We appreciate your time, and we look forward to the committee's questions.

● (1545)

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

[*Translation*]

We will now start with Luc Berthold, for the Conservatives.

You have six minutes.

Mr. Luc Berthold (Mégantic—L'Érable, CPC): Thank you very much, Mr. Chair.

Thank you very much for your presentations. They were very instructive.

We begin this study with our minds fully open. Changes in climate, the effects on soil quality, access to water and everything related, are vast topics. This issue is a concern for many producers all over Canada. It should also be a concern for consumers because, ultimately, everything on our plates comes from the earth, at least the vast majority of food does.

My question is very simple. Every time I meet groups of producers, especially producers of grains of all kinds, everyone talks about expanding their production capacity in the coming years. They are talking about doubling their production in the next 10 years. There are also government targets for a quite significant increase in exports.

When people talk to us about those objectives, they say nothing about the constraints associated with climate change. Everything seems fine and dandy and there seem to be no fears as to the ability to double production, to deliver the product, and to achieve the objectives. I would like to hear what you have to say about that.

Let’s start with the people from CropLife Canada, and then go to Ms. Miller.

[*English*]

Mr. Dennis Prouse: There is no question that ambitious goals have been set out. We saw them in budget 2017, and we hear them talked about. What we've said is that we need a regulatory system that is flexible enough to provide new tools to farmers. There won't be that expansion without a regulatory system that is responsive enough.

We keep coming back to that, because those regulators hold in their hands the keys to any innovations we have. They have to go through the regulatory system. We support that regulatory system. Canada has a science-based regulatory system.

[*Translation*]

Mr. Luc Berthold: If I understand correctly, you are afraid that those ambitious objectives cannot be achieved if changes are not made to the way in which the industry is regulated.

[*English*]

Mr. Dennis Prouse: Yes, that is correct. We need change and reform in our regulatory system if we want to realize those goals, because they're exceptionally ambitious. We're talking about trying to take Canada from number five in the world to number two. That's a tremendous goal, and we're excited about that goal, but there needs to be a road map to get there.

[*Translation*]

Mr. Luc Berthold: Do you have a specific example of a regulation we need? If we had to approve a regulation and it could be done quickly, which one should we choose?

[*English*]

Mr. Dennis Prouse: Over to you, Ian.

[*Translation*]

Mr. Ian Affleck (Executive Director, Plant Biotechnology, CropLife Canada): Thank you for the question.

[*English*]

I think a good example is around plant biotechnology specifically and new products of biotechnology. To drive the kind of innovation we need to see, Canada has to get these tools in the hands of farmers as quickly as possible and as safely as possible. In no way should we be compromising the safety of our regulatory system, but we should move it forward quickly.

I think you're probably looking for a specific crop.

● (1550)

[*Translation*]

Mr. Luc Berthold: Could you tell me, quickly, because time is unfortunately limited here, what the main irritant in this area is?

[*English*]

Mr. Ian Affleck: I would say it's in two pieces, time and cost. It takes about two to three years to get a product approved in Canada right now. A large portion of that time is spent with the file sitting in a queue and not being looked at, sometimes for 12 months. If we could get it started faster, it would be finished faster.

The second is the overall data requirements and the cost. That's very limiting to small start-up companies who may want to get into this space. They have a hard time getting started because they can't meet those overall regulatory costs that the big companies can.

If we want to see broad innovation in a lot of small niche markets that are going to build toward this greater goal, we need to impact those costs so we can get those smaller players. Okanagan is a great example of a smaller player. They had to raise a lot of capital to get through that regulatory process to get that product on the market.

[*Translation*]

Mr. Luc Berthold: Ms. Miller, along the same lines, is the objective of doubling production incompatible with the idea of sustainable agriculture? Do you think we can get there?

[*English*]

Ms. Susie Miller: I think in terms of sustainability, one of the things that climate change will do is change the meaning of sustainability and what the expectations are. From an individual farmer's perspective, they're dealing with the conditions they're facing right at the moment. Because they don't know exactly what the impacts are, they're focused on the current conditions, the current state of technology, the current markets, and what they're going to do this year, next year, and five years down the road.

[*Translation*]

Mr. Luc Berthold: So, according to your research and your studies, it is difficult for us to project what the situation will be in 10 years and therefore to say whether we can double production.

[*English*]

Ms. Susie Miller: Well I think in terms of the situation currently, the producers adapt to the needs of the market. One of the contributions we're trying to make is to let them know exactly what's required.

For example, and my colleague talked about it, the adoption of tillage has benefits from an environmental perspective, but it also has benefits from a financial perspective.

[*Translation*]

The Chair: Thank you, Mr. Berthold.

Mr. Peschisolido, the floor is now yours for six minutes.

[*English*]

Mr. Joe Peschisolido (Steveston—Richmond East, Lib.): Thank you Mr. Chair.

I'd like to thank all the witnesses for appearing before us today.

All of you touched on the need to expand production—we get more stuff from fewer factors—but also the need to do it in a sustainable way, to limit the bad impact that occurs on soil, water, the environment.

You talked about two other things. You implied there were funding issues, but you also talked about a regulatory regime.

Ms. Miller, I was fascinated by your initiatives. You talked about a few initiatives and that you have a matching funds program.

Where do you think the government could gear its funds to help you in obtaining the goals you'd like to do?

Ms. Susie Miller: Thank you for the question.

I think there are some things we have found during the last four years.

One is the importance of dialogue. It's not evident that people talk to each other, or different organizations talk to each other. When you're trying to bridge the gap from the market all the way back to the producers, but also including civil society and environmental groups, which we're trying very hard to do, it takes time to generate that particular understanding.

I think the second area is in the investment in data. There's a lot of investment in data, a lot of talk about big data, efforts made for open data, but not necessarily in a way that can be used for our purposes. We're trying to do something new here. As we try to do something new, we're hoping it will inform those kinds of decisions.

Mr. Joe Peschisolido: Ms. Miller, there are those who participate in that dialogue who deny climate change. They say that it's not an issue, that we shouldn't be dealing with increased greenhouse gas emissions.

Do you believe that climate change is an issue and that we should be dealing with it?

Ms. Susie Miller: Everybody that comes to our table, the Canadian Roundtable for Sustainable Crops, has a commitment to enhancing environmental sustainability. That's a precondition for membership. We have every grain-producing organization in Canada and, as I said, the grain handlers, the retailers, etc. It's never come up in our discussions.

● (1555)

Mr. Joe Peschisolido: All right.

You've discussed the inputs. You talked about manure versus artificial fertilizer. Can you talk about that? Does it matter what type of inputs the farmers are using, as it relates to water quality and environmental issues?

Ms. Susie Miller: From the perspective of the market requirements and the sustainability requirements, the source is important only in how it's used. For example, for manure, there is more of an emphasis on storage because it just doesn't appear overnight or get used overnight, so there's a storage period. However, the principles are the same. You use the right product, in the right amount, at the right time, and in the right place, which are actually the four Rs that Fertilizer Canada is promoting. That's exactly what they want. The issue with fertilizers, other than the incidental potential contamination while it's being stored, is that it be utilized by the crop and not be available for runoff into water.

Mr. Joe Peschisolido: Okay.

Mr. Prouse, you mentioned something that I think is key. I apologize, but I'm going to paraphrase. You'd like the government to help in realizing the dream of better yields. Can you elaborate on how we can do that both on the funding side and on the side of our regs?

Mr. Dennis Prouse: Sure.

My colleague, Ian, referred to it somewhat regarding speeding up the approval process. Right now, we look at that two- to three-year period. If we want to make Canada a leader in biotech and in investment, we should be able to drive that down to a one-year period. There's no cost to the government for that. That's simply a matter of applying better principles and speeding up the process.

On funding, it's making sure that those regulatory agencies are fully staffed, so they can deal with not only the technical requirements, but also a lot of trade issues that are now involved. For example, the Pest Management Regulatory Agency not only deals with health and safety issues, but they also end up dealing with issues of what's called MRL, maximum residue limits, that have impacts on trade. Are those regulatory agencies staffed well enough to provide the resources that are going to be required? That would be the funding issue that would come up for us.

However, the reform of the regulatory system—and my colleague, Ian, could speak to that more fully—is something that we're pushing because we want to make Canada a centre for that investment in biotech. We know that research is going to take place. It's going to take place somewhere in the world. We'd like it to take place in Canada.

Mr. Joe Peschisolido: Can you talk about the Okanagan apple?

Mr. Dennis Prouse: Sure, but go ahead, Ian.

Mr. Ian Affleck: Maybe I'll add one point to the end of that, too.

We have great intellectual capital in Canada in plant breeding, within groups like the crop development centre at the University of Saskatchewan. Those groups want to get into this space of modern traits, but they are scared of the regulatory system, the costs, and that they can't afford it. There's a balance between funding for those great breeding centres we have in Canada, with those public-private partnerships, to accelerate that, but then they have to know they can get that innovation to market through our own regulatory system. This is why they don't go there now. They're a great group to talk to if you want to talk about plant breeding.

The Okanagan apple—

The Chair: I'm going to have to cut you off.

Mr. Ian Affleck: Fair enough.

The Chair: Maybe it'll come up with another member.

[*Translation*]

Ms. Brosseau, you have six minutes.

[*English*]

Ms. Ruth Ellen Brosseau (Berthier—Maskinongé, NDP): Thank you, Chair.

Usually when we start studies, we have departmental officials. I'm so happy to have you guys in to break the ice and start this important study. I think it is the first time that we're really delving into a study about climate change, soil, and sustainability, which I'm really happy that we're finally doing.

I just have a question for you, Mr. Prouse.

We were talking about approval processes. How long does it take to get things approved in the United States compared to Canada?

Mr. Dennis Prouse: The basis of the U.S. system is similar. They are a science-based system—and Ian could speak to this. It does tend to be a bit faster in the United States now. It's up in the air as to where that's going because in the U.S., they are now questioning how they are going to regulate, if at all, some of the new technologies that are coming along, including what's called CRISPR technology.

Ian, if you can explain that in 30 seconds, that would be amazing.

Mr. Ian Affleck: Well, I guess you can say that CRISPR is.... Conventional plant breeding has been happening for 10,000 years. The modern stuff that we're talking about and that we regulate right now has been happening in the last 50 to 60 years. CRISPR is the next 40 years. This is the new technology. It's faster. It's more precise. It's easier to generate the data required for regulations, so it's an exciting new field. It's also far more accessible to smaller businesses, because the cost of innovation goes down. This really could create a much more diverse innovation marketplace.

Going back to the U.S. and how they compare, on average they're faster than we are, but not by a lot. If you look at the average, you'll see that it's, say, 18 months versus 24. They do have some interesting policy tools, whereby if you bring in something that looks a lot like something else, they can bridge it and give you a very quick approval in four to six months for very similar products. Where their system slows down is that it can become very litigious. You can sue those government agencies, which then jams things up for 12 years. It's excellent that Canada stands on science and doesn't have that problem.

The biggest interest is in their proposals about what we are going to do in the future. We have 20 years of history in regulating these products, and never have we or anyone in the world seen a problem. Are we going to put that same level of regulatory barrier in front of the next generation of products when we can learn from the last 20 years and maybe have a more modernized approach? There's an opportunity for Canada to work with the U.S. there, not just to do what they're doing, but to influence what they're doing to make sure it lands in line with what we think the appropriate science is here in Canada.

● (1600)

Ms. Ruth Ellen Brosseau: According to Agriculture and Agri-Food Canada, on their website they talk a lot about the impacts of climate change. They talk about opportunities and the challenges we've had. In some years we've had horrible droughts, and then we've had flooding.

We had really bad flooding in my riding. I have some farmers who had so many delays and who lost a lot of yield. Could you talk about how things have evolved—seed varieties—and how farmers can make sure that they have the tools to deal with climate change and adapt for the future? We are talking a lot about augmenting the production and having all these trade agreements and exporting. Can you talk about what is necessary to deal with and fight climate change?

Mr. Ian Affleck: Before I start, I'll say that I get really excited when I talk about this area.

Biotechnology in crop protection is not a silver bullet. It's just a set of tools in the farmer's tool box. They need to draw on the tools from every production practice they can find in order to get what works on their farms, but there are some specific technologies that are coming or could come in terms of having crops that will survive when they're under water for a few days, so that when they come out of the water, they'll still grow.

These are in laboratories. The idea is there, but unfortunately, if these are being carried by companies, return on investment becomes critical to them making it to the marketplace. The major cost there is the regulatory science required to get through regulation. If that barrier is high, those products will take longer to come to market, because the demand won't be as high until the climate situation becomes more serious. The lower those barriers, the faster they will come to market, and the more small players you will have bringing in more and unique products to put in that farmer's tool box. That is one of the major pieces.

On the apple, for example, we don't have service standards for biotechnology approvals in Canada. They had no idea how long it would take. When you tell your venture capitalist that you have an innovation and it's fantastic, but you have no idea whether it's going to make it to market, it's very hard for that venture capital person to keep cutting cheques to keep the lights when you're going “maybe next month, maybe next month...”.

Basic service standards to drive rigour there would help create the predictability that they could bring those new water-tolerant, drought-tolerant, or salt-tolerant products to the marketplace. We already have drought-tolerant corn that's available and on the market, but there's more we can do.

Mr. Dennis Prouse: Yes, and very quickly, that drought-tolerant corn is what allowed the United States to actually have a yield two summers ago when they had a terrible drought. They ended up having a yield equivalent to about 1990's, which wasn't great, but 50 years ago, drought conditions like that would have completely wiped out the crop. They would have had no corn yield whatsoever. They were still able to have a crop. Why? Modern plant science is why they were able to actually have some semblance of a crop even under terrible conditions like that.

Ms. Ruth Ellen Brosseau: Do I have time to ask Ms. Miller a question?

The Chair: You have five seconds.

Ms. Ruth Ellen Brosseau: Could you maybe elaborate a little more on the sustainable indicators we have in Canada and if they align with international ones?

Voices: Oh, oh!

Ms. Ruth Ellen Brosseau: That was good, wasn't it?

Could she answer?

● (1605)

The Chair: Maybe somebody will pick it up.

Monsieur Drouin, you have six minutes.

Mr. Francis Drouin (Glengarry—Prescott—Russell, Lib.): We collaborate on this committee, so if she wants to—

Ms. Susie Miller: Do you want me to answer?

Mr. Francis Drouin: Yes, continue.

Ms. Susie Miller: We have 12 different categories, and we have aligned them with what is required internationally and what is commonly considered to be sustainability. In terms of social responsibility, it includes worker safety and security but also the safety and security of the producer himself or herself, labour relations, working conditions such as minimum wage benefits and so on, and relationships with the community.

In terms of the environment, one is agrochemical management or management of pesticides. There is nutrient management. We talked about that before. There is soil quality and productivity; water quality and quantity, specific to what you do to protect that; and land use and biodiversity management. There's a lot of emphasis on not converting forest land or sensitive land to annual cropping. There is greenhouse gas emissions, air quality, management of waste and pollution, and then financial viability.

We've been able to collect information on all of those. In terms of performance, we're not at that stage yet. We have some good stories to tell and we have some improvements to make. The purpose of the platform will be to put the information out there and use it as a base to move forward.

Mr. Francis Drouin: Thank you.

Mr. Affleck, I was curious about what the U.S. is thinking. You mentioned the CRISPR method, which I was familiar with, but on the medical side. I know that this is something that's the next revolution in gene editing. I'm curious to know what an acceptable timeline for CropLife would be in terms of getting regulations. Right now we're at two years. Should we try to get down to one year, or as quickly as possible? I know that with the CRISPR method, technologies get quicker, so obviously, the goal is to shorten that cycle. I'm curious to find out what the Government of Canada's goal should be.

Mr. Ian Affleck: As Dennis said earlier, we earmark a one-year turnaround time as being what is easily achievable, given that in our experience, the files typically sit for 12 months of the 24 months before they're opened anyway. If you can reduce or eliminate that backlog, you've already landed a 12-month review. You're just spending 12 months in a queue.

To give credit to the regulators, they're looking at the United States, which has what they call the extension program. If you bring in something very similar to something else, we can make an even faster decision, because we're familiar with the product you've brought forward. They're investigating adopting a practice like that, but that would help only in bringing things to market very similar to what we already have. For what you're talking about, which is bringing new and unique products to the marketplace, that extension program really wouldn't help. We need to get rid of that dead space at the beginning and get right to the file and get it moving.

There are also opportunities within the review where you have Health Canada and CFIA and the two departments all doing the toxicology review. Could they do one and collaborate? Are there efficiencies there? That's a bigger project, but it's something we could look into. That first chunk should be easy to move off the board. Well, easy is probably oversimplifying. It should be movable, to be fair.

Mr. Dennis Prouse: I'll add very quickly that it was today, in fact, that the U.S. Department of Agriculture announced that it has tossed aside the previous set of proposals on regulating these. It is not proceeding with that particular set. It is going back to the drawing board in terms of looking at how it is going to regulate these technologies. Obviously, that's something that we in Canada are going to have to watch extremely carefully, because where is the global competition for investment dollars? That's obviously a big part of where it is.

Mr. Francis Drouin: Yes. Obviously we want to create similar regulations to the U.S. if we're going to level the playing field.

Mr. Dennis Prouse: Our member companies will tell you that the battle for investment happens internally. When there is a multi-national company, and it is deciding where to invest, within the company the various branches have to fight for their space, if you will. That's why it is so incredibly important for Canada to be competitive and to benchmark itself, in terms of regulation, to where we are globally. We have to stand up and fight for our share of that investment.

● (1610)

Mr. Francis Drouin: I'm just curious to find out.... I'll just give you my personal experience in the riding on the unpredictability that climate change causes and I guess it's too soon to say if it was caused by climate change but I'll let the scientists answer that. They've spoken loud and clear on that. Last year in my riding there was a drought. This year it was a wet season. How is your industry positioning itself in helping farmers plant that right seed or that right crop that particular year? It's getting tougher and tougher to provide that predictability in the weather systems.

Mr. Dennis Prouse: That is why we've said that farmers are dealing with the effects of climate change now. This isn't an abstract. In many ways, as you've seen, they're seeing it now. You can parse words and you can call it what you like but they are having to deal with the here and now. That just speaks to the research on seeds. How many different varieties of seeds can we provide for farmers to buy? How many different options can we give them? That's the battle and, as Ian pointed out earlier, there is no magic wand here and we have to be careful that we're not out there promoting that there's a technological panacea out there for all of this.

We think that there are more tools in the tool box that we can give farmers on that.

The Chair: Thank you, Mr. Prouse.

Mr. Longfield, you have six minutes.

Mr. Lloyd Longfield (Guelph, Lib.): Thank you, Mr. Chair, and thanks to everybody for coming. You'll see that our conversations in this committee flow one into the other.

In terms of the discussion around climate change and the response to it, I'm going to go back to the soil and thinking of precision agriculture and precision monitoring of the soil. Could any of you speak to the use of data, the use of what we are measuring within the soil to try to make sure that we start in the right place to increase productivity?

Mr. Dennis Prouse: I'll ask the farmer to go first.

Mr. Ian Affleck: I grew up on a potato farm in P.E.I. and I've seen this evolve just in my lifespan. When I was young, we had the first kind of GPS mapping of our fields and it was on half-kilometre squares and now you're getting it down to applying lime where the lime spreader is changing how much it's putting on as you drive down the field. It's really incredible. That mapping is taking off and you're starting to see farmers farm with drones to look at different disease issues in different corners of the farm. Maybe all they have to do is spray in one part and not the whole field because they don't have a full field issue.

Gathering that data and storing it both for the uses it has now and the uses it will have in the future that we don't even know about yet.... But if you hadn't mapped it now, looking back you wouldn't be able to see those trends. I think Susie's group and the data they're collecting is going to be part of that. Precision farming is going to be front and centre in every element between the seeds you use in one part of your fields...maybe you'll change varieties in the future as you're driving down the field because you know one corner is different from another corner. It's not going to be as simple as one variety in 100 acres. You're going to see things start to change.

Ms. Susie Miller: Just to follow up, I can't provide you at this moment with the exact numbers but it was something that has been followed by the farm environmental management survey and the agriculture census as to what kind of, I would say, technology whether it's the precision farming or GPS or various technologies. We also included it in our survey. It definitely is increasing. For example, the ability to use variable rate fertilizer has increased the uptake of the fertilizer, the usage of the fertilizer, that is put in the ground and basically has reduced the overall environmental footprint. When it comes out in January, we'll have a definitive answer as to how much progress we've made.

Mr. Lloyd Longfield: Great. Mr. Drouin and I were at the outdoor farm show and went to the different booths that had to do with drone technology versus using a vehicle to do the sensing, physical sensing versus drone sensing, and the arguments going on around that.

Have we come to a point in the science where we have an integrated tri-cycle approach with carbon and nitrogen and water forming some kind of a database of where we need to be? Is there an optimum soil condition that we're trying to maintain or does that change by farm?

● (1615)

Mr. Ian Affleck: From my farming experience, I think that it changes by farm and by field, but that's what intrinsically every farmer is trying to achieve within their own subset. This ability to track and find trends and data that we couldn't find before will help them find that balance.

I'll go back to one of the earlier questions around wanting to raise our agricultural outputs by an enormous amount. As Susie said, we want to do that while showing a trend in the environmental impact being down. I think farmers intrinsically understand. They're trying to do both, and they intend to do both, to increase the outputs and reduce the inputs and their environmental impact.

That equilibrium is exactly what they need to find. Then add in technologies of seeds that are more nitrogen-use efficient so they don't need to use quite as much because the equilibrium—I'm seeing this as I'm planting that field—changes as the variety changes. What does that variety need for nutrients versus this variety?

Mr. Lloyd Longfield: Right, but when you're sensing it coming up, you'll see what's reacting and what isn't reacting to what you're putting down.

I remember one conservation with an older farmer who said he didn't believe it. He didn't believe that he wouldn't have to go back out onto his field a couple of times a month. He didn't believe that he was going to get the results, but he took a risk and said, “Okay, I'm going to see whether they're right or not.”

There's a farmer trust issue. Is that just one person, or is that something that as we do our study—

Mr. Ian Affleck: I don't think farmers trust anything. I think they have to test it.

My dad was always that way. He would say, “This looks great. I'm going to do some alternating strips, and I'm going to prove it on my farm.” However, you need that data first to get them to buy into the test because the test is a risk for them. They're putting money on the table to do the test, so they want to see the proof. They want to try it on their farm, but once they're in, then the next year they're in 100%. I saw that with many things on our farm.

I remember trying to make sure the cultivators stayed in the rows. As soon as my dad figured out that the computer could do it better than I could, we had it on every tractor.

Mr. Lloyd Longfield: Right.

In terms of government policy then, there's a risk management piece. There is introducing new technology and somehow incentivizing farmers to try these new technologies that will improve.

What's the state of that? Is our current policy framework handling that, or is it something we need to look at?

The Chair: I'm going to have to put a hold on that. The time is up. Perhaps you'll have a chance....

Mr. Barlow, you have six minutes.

Mr. John Barlow (Foothills, CPC): Thank you very much, Mr. Chair.

It's great to hear some of these stories about the innovation and the stewardship that our farmers have been doing. Our farmers and ranchers are some of the most environmentally conscious people in the country. I don't think any of us would argue that point. They live on the land. It's their livelihood.

That touches on something that is very important as part of this discussion: the fact that our farmers and ranchers have been doing this for generations. They've been embracing technology, embracing innovation, and ensuring they do everything possible to protect their land and ensure it is productive.

During a previous study, we had a witness in here who had a greenhouse in B.C., and the carbon tax was costing her $50,000 a year, so she closed her greenhouse.

With Alberta now having the carbon tax, I have farmers and ranchers in my constituency who it is costing anywhere from between $50,000 and $125,000 a year in additional costs. So, there are concerns that our farmers, ranchers, and greenhouse producers and operators have been doing all of these things to ensure that they have as small a carbon footprint as they can before this was even an in-vogue discussion to have, and yet they are being punished for doing everything right.

As we talk about climate change, I agree with my colleague, Mr. Drouin, that today is not the place to have a debate on whether it's true or not, but I do want to say, Mr. Drouin, that we should all have your farmers who can predict the weather. It's impressive that they've been able to predict the weather before now.

Mr. Francis Drouin: No, they couldn't.

Mr. John Barlow: As we go forward with a carbon tax plan on the federal government side, is there any discussion among your members—and your members as well, Susie—about exempting agriculture from these types of things because of the things and the activities that you have done, whether it's Roundup Ready seeds or no tillage, the technology that's been there to reduce water usage? Have there been discussions on that side?

Maybe that's a message we could take forward when it comes to implementing a federal carbon tax.

● (1620)

Mr. Dennis Prouse: I think that the grower groups themselves would be better positioned to speak to that. We don't represent those grower groups. Much as with Susie's group, everybody that we work with is committed to sustainability, and we're working toward sustainability broadly. Those more specific competitiveness issues would probably be best addressed by the actual grower groups that represent those farmers. I don't think they'd want me speaking for them.

Mr. John Barlow: Okay, I appreciate that.

Susie.

Ms. Susie Miller: There are no discussions. Again, it's not the kind of forum where we have those types of discussions, but we do know that the carbon life cycle report that we have conducted, which will be published in January, is a helpful measurement tool in any kind of policy discussion. That's our contribution.

Mr. John Barlow: I appreciate that, and that's a message we'll maybe take forward—you touched on it—that it's not only the cost, but it makes them uncompetitive globally when we're talking about our trading partners not having those costs. I think that's something we have to be cognizant of.

You also talked a bit about the regulatory process. I want to touch on that as well.

Dennis and Ian, you were saying it takes two to three years to get approved in Canada, but I think that's only one step, because we have also heard from the canola growers that they have some breeds that they would like to get to market, but China is not giving them the go-ahead. I don't know if everybody is aware of that, but if they don't have the unanimous consent of all our trading partners, they won't move ahead with it. Some of these non-tariff trade barriers also have an impact on this. Maybe you could touch on what the global perspective is on some of these regulatory obstacles.

Mr. Dennis Prouse: Sure, I can start, and I'm sure Ian can finish with anything I may have missed.

You're right. If China, which is the most important market for canola, doesn't approve a trade, that means a Canadian farmer can't grow and does not get the benefit from those technologies. When I tell people that story, they find that fairly shocking, but that would be true of any number of markets. It speaks to why, when Canada is negotiating international trade agreements, the issue of non-tariff trade barriers is incredibly vital to agriculture. You will generally find around the world that, as tariffs fall, non-tariff trade barriers tend to rise.

I'm not saying anything that governments both previous and current don't understand very well, and the negotiating teams understand those, but we have to continue to make the point, because it does affect the competitiveness of Canadian farmers.

Mr. Ian Affleck: In those discussions with those key trading partners, if we don't have the best system under the best science, it's very hard to wag our fingers at a trading partner and say, “You should go faster” and they say, “Well, you don't have any service standards.” You say you'll do it in two years, but you can't really point to a rule that says you'll have it done.

Also, we can't apply to China until we have Canadian approval. If it takes two to three years to get ours and then four to five years to get China's, if ours was done in a year, then that would shave a year or two off the end of the approval process. If we have a more streamlined and efficient system in those trade agreement discussions or in bilaterals, we can go forward and say, “We are not just asking you to do better. Let us show you what it looks like to do better. It looks like this.” If you don't have that, it's very hard to criticize someone else's system. I think that would be beneficial for us in those debates as well.

[*Translation*]

The Chair: Thank you, Mr. Barlow.

We will now hear from Mr. Breton for six minutes.

Mr. Pierre Breton (Shefford, Lib.): Thank you, Mr. Chair.

Thank you all for being here today.

Some experts say that climate change could have some positive effects, for example extending the growing season and reducing costs in some areas like animal feed. What do you think of statements to the effect that it could also be an opportunity for us? We know that climate change brings with it a lot of negative consequences: major rainfall, floods, and droughts at times. However, there could also be positive aspects, and I would like to hear each of your points of view about it.

● (1625)

[*English*]

Ms. Susie Miller: In terms of the positive benefits of climate change, I think it all speaks to the ability of the producers to adapt. There are pros and cons to each one. For example, it can get warmer, but on the other hand, that may increase the pests, and therefore, it may require more pesticides or more crop losses.

The whole issue is adaptability and the ability of the producers. There has been a significant adaptation. For example, 25 years ago there were no peas, beans, or lentils grown in western Canada, in the Prairies, and now we're the largest exporter of red lentils in the world, not only because of the technology, but because of innovation.

From the perspective of the work we're doing on the CRSC, there will be pluses and minuses. Water conservation may become more important if there's less of it. If we increase our pesticide use because we have more pests—and I'm saying "if"—then we'll have to take more care in terms of managing that. It's all about adaptation and ability. Climate change may have good benefits, bad impacts, or just change.

Mr. Dennis Prouse: I ran into a grower at a conference who was growing quinoa in Manitoba. It surprised us, but this was happening.

To Susie's point, it's going to be a mixed bag. There are going to be positive impacts and there are going to be negative impacts. How do we help farmers manage those? I said to Madame Brosseau when we were speaking before the meeting started that it's a very nuanced and complex story that isn't easily told in 140 characters. That's the challenge. But there's no question that the growing zones are expanding in Canada, and Canada is uniquely positioned to expand our production and help feed the world over the next number of decades. The experts are clear on that.

Mr. Ian Affleck: To echo what was said here, and I think it was covered very well, it's about that turnaround time and how quickly we can bring a new variety to the marketplace for a farmer. Even a conventionally bred variety takes seven to nine years to bring forward. A biotech variety takes 10 to 15 years. If things are starting to change faster, it's going to take us a long time to catch up to that change. When you start to have more efficient regulation, you reduce the data requirements because of the history of safe use and you can bring that down to nine years. Or you add CRISPR, which takes some of the lab work down, and you get it down to seven years, so now you're reacting to that climate change much faster to take advantage of those challenges or opportunities and to manage the challenges that come on the other side of that coin.

[*Translation*]

Mr. Pierre Breton: I am going to close with a statement that you also made.

This is not just an issue for Canada; it is an issue for the world. I feel that if producers, processors and the government work in collaboration, Canadian producers could find this to be a worthwhile challenge in terms of exports and in terms of being leaders in agriculture that has adapted to climate change.

Thank you for your testimony today.

The Chair: Thank you, Mr. Breton.

If I may, I am going to make a comment too.

We can do a lot about climate change thanks to technology. But we also have to realize that the problem is real. Where I live, the Acadian forest provides wood for sawmills. However, if things continue as they are, in 20, 40 or 50 years, the forest will disappear from our area, together with the blueberries and the other things that grow there.

We have the technology, I agree, but we also have to be aware that other measures are needed.

[*English*]

I want to thank everyone for being here. We had a very interesting conversation, which will continue, I'm sure.

Mr. Affleck, Mr. Prouse, and Ms. Miller, thank you so much.

We'll pause for a short break to bring in our next panel.

● (1625)

(Pause)

● (1630)

The Chair: Let's start the second half.

I welcome the second panel with us today.

From le Conseil canadien de l'horticulture, we have Rebecca Lee, executive director. Welcome. We also have Jan VanderHout, member of the environment committee.

From le Conseil canadien de conservation des sols, we have Mr. Alan Kruszel, president.

From USC Canada, we have Martin Settle, executive director, and Geneviève Grossenbacher, program manager.

We'll start with the Canadian Horticultural Council. You have up to 10 minutes.

● (1635)

Ms. Rebecca Lee (Executive Director, Canadian Horticultural Council): Good afternoon, everybody.

Thank you for the opportunity to appear today to discuss the impacts of climate change on Canada's horticultural sector.

The Canadian Horticultural Council, or CHC, is a national association that represents fruit and vegetable growers across Canada involved in the production of over 120 different types of crops on over 27,500 farms, with farm cash receipts of $6 billion in 2016. For almost 100 years, CHC has advocated on important issues that impact Canada's horticultural sector, promoting the continued success of our industry as it delivers healthy, safe, and sustainable food to Canadians.

The horticultural sector stands behind the federal government's goal in budget 2017 to increase agrifood exports to $75 billion by 2025. However, producers face many challenges, including environmental challenges and competition from countries with laxer regulations or regulations not based on science. The federal government can help address these challenges by recognizing all kinds of agricultural fuels in its national carbon policy and by supporting additional research and innovation in the horticultural sector.

Mr. Jan VanderHout (Member of the Environment Committee, Canadian Horticultural Council): Canadian producers have a vested interest in sustainable growing practices and environmental stewardship, and growers often invest in programs and new technology that help to mitigate these risks. For example, greenhouse growers have developed innovative ways to recycle the carbon they produce as food-grade CO2 for their plants. However, such sustainable innovation has not been recognized in a uniform way across Canada, resulting in disparate carbon pricing policies among provinces.

The added costs of these policies, together with the capital-intensive infrastructure needed for the construction of greenhouse facilities, make the sector vulnerable to carbon leakage, whereby companies, in an attempt to remain competitive, expand their operations in jurisdictions that aren't subject to carbon pricing, such as the U.S. and Mexico. Due to the global nature of the produce market, new costs of production are not easily passed on to consumers. This reality impacts the price of domestically grown food in the marketplace and, ultimately, Canada's competitiveness.

While fruit and vegetable growers are committed to environmentally friendly production practices, the are also dependent on favourable energy costs and a stable, supportive tax regime to remain competitive and stay in business.

CHC urges the federal government to include natural gas and propane in its list of proposed agricultural fuels exempt from its national carbon pricing policy, as these fuels produce exhaust that is partly recycled by greenhouses as food-grade CO2, enhancing plant growth. This exemption would minimize the regional disparity seen in the current pricing models and support Canada's upcoming food policy by increasing access to affordable food; improving health and food safety; conserving our soil, water, and air; and growing more high-quality food.

Ms. Rebecca Lee: CHC continues to advocate on behalf of growers through the Pest Management Regulatory Agency's process for the re-evaluation of crop protection products and for improvements to the policies that guide the PMRA's regulatory decisions.

CHC also continues to advocate for the harmonization of many aspects of the pesticide regulatory system, including maximum residue limits and joint international reviews. In this vein, we also continue to support the Pest Management Centre's minor use pesticide program and pesticide risk reduction activities.

Because plant health, biosecurity, and up-to-date pest risk assessments are all key components to market access and are important to the protection fo the environment, CHC develops and advances crop protection management policies and programs that support market access and promote the economic viability and competitiveness of Canada's fruit and vegetable growers, while providing safe, healthy food to consumers across Canada.

Climate change and growth in international trade also mean the introduction of many new pests in Canadian horticulture. Regulatory agencies must respond to these new invasive pests and plant diseases more quickly than ever before. These challenges are increasingly important and costly to manage as we endeavour to reduce our carbon footprint and feed a growing global population.

CHC urges the federal government to provide adequate funding for the Pest Management Regulatory Agency, the Canadian Food Inspection Agency, and the Pest Management Centre, to ensure access to appropriate crop protection tools and adequate inspection services. Without increased support, these agencies will be limited in their ability to respond rapidly to invasive pests and plant diseases, which in turn jeopardizes the health of our industry and Canada's ability to meet export targets.

Finally, I would like to provide comment on a few other areas where CHC continues to advocate for our producers' growth in a safe and sustainable way.

CHC urges the government to support research by increasing funds for the Canadian agricultural partnership. During consultations on the governments's next agricultural policy framework, we outlined how we need additional support to advance the environmental sustainability of our sector. We believe that this can be achieved by aligning programming between the Canadian agricultural partnership and the pan-Canadian framework on clean growth and climate change.

Access to water and advanced irrigation technology will be critical for fruit and vegetable growers to be able to deal with more severe and more frequent extreme events. Government policy support and infrastructure projects are needed to secure a supply of good, clean water for agricultural purposes. CHC recommends that Canadian agricultural water infrastructure investments be supported by low-cost loans through the newly created Canada infrastructure bank.

CHC also urges the government to support innovation in the horticultural sector. For example, tree fruit growers have put together a proposal that would innovate and grow the apple sector in Canada, which would in turn increase agrifood exports.

We encourage the government to work collaboratively across departments and with industry stakeholders to leverage our combined resources and expertise to ensure that Canada is presented with climate change and conservation polices that are balanced and without unintended consequences for farmers, Canadians, and the global food supply.

Thank you for your time. We look forward to your questions.

● (1640)

The Chair: Thank you so much, Ms. Lee.

Now, with the Soil Conservation Council of Canada, we have Mr. Alan Kruszel.

Mr. Alan Kruszel (Chairman, Soil Conservation Council of Canada): Mr. Chair and committee members, thank you very much for the opportunity to be here today. The council is very delighted to be able to take part in your study on soils because we are very interested in soils.

I am Alan Kruszel. I'm the chairman of this fine association called the Soil Conservation Council of Canada. I have a farm about an hour and half southeast of here, near Cornwall, Ontario, where we grow cash crops.

I'll say a little bit about the council. We are the only national soil care organization in Canada. We provide leadership, improve understanding, facilitate communications, encourage sound policy, and work collaboratively with anyone who wants to talk about soils. We are the face and voice of soil conservation in Canada.

We've done a couple of different things over the last number of years. I'll highlight them quickly for you.

We co-hosted the sixth World Congress on Conservation Agriculture back in 2014 in Winnipeg, where more than 400 attendees from more than 100 different countries all came together to talk about conservation agriculture and what we can do to improve things around the globe.

We hosted a conservation practitioners meeting with our friends from the CRSC, Susie's group. We talked with agriculture groups and environmental groups like the World Wildlife Fund and Ducks Unlimited to see if we could come up a shared vision for the ag landscape across Canada. We were very proud to be able to come out with a joint statement on that vision.

We've hosted national and regional soils summits. Our most recent one was held in Lloyd's riding back in August. We had more than 180 people come in to talk about the costs and consequences of soil degradation across Canada.

We have a really fun project going on called “soil your undies”. We'll talk a bit more about that later. It's actually a scientific test where you bury cotton underwear in the ground. You leave it for a few months, dig it back up, and see the results of the decomposition. If it is very decomposed, in general you can assume that there's some pretty healthy biological activity going on in your soils. It's lots of fun.

[*Translation*]

In French, it's called *Salissez vos bobettes*.

[*English*]

Mr. John Barlow: You take them off first, though.

Some hon. members: Oh, oh!

Mr. Alan Kruszel: You certainly do.

Unfortunately, ladies and gentlemen, soil conservation is not something that is done. We have made great strides in this country on conserving our soils. We are no longer the dirty thirties. We have made some vast improvements, but there is an enormous amount of stuff that still needs to be done.

Today, we're going to focus on a couple of things—tillage and organic matter losses. Those are the biggies that we want to talk to you about today. These are still huge issues. If I keep spewing off words like “organic matter”, think carbon. If we are losing carbon from our soils, that is a problem. We are still losing quite a bit of carbon from our Canadian agricultural soils.

Western Canada is doing better than eastern Canada, I have to say. So to our colleagues from the west, congratulations, you've done a pretty good job, although there's still work to be done. Recently, the council has noticed that there is a little bit more tillage going on in western Canada than there used to be. There are vertical tillage tools coming out now that are quite prominent around Alberta and Saskatchewan, on land that was previously not tilled, direct seeded, with no disturbance at all. That's a little worrisome as far as we're concerned.

No-till adoption—planting without any tillage—in eastern Canada, however, is still very, very low. Our estimates are that about one-third of cropland is planted using no-till practices—that comes from the census—but there is much, much less permanent no-till area.

Another issue we've discovered, which we're going to bring to your attention, although I'm sure those of you who live in urban ridings have seen this, is that urban sprawl is removing productive land from agriculture. It's a huge, huge issue. We have to do something about that.

We talk about tillage as something that is the equivalent of an earthquake, a hurricane, a tornado, and a forest fire all occurring simultaneously for the world of soil organisms. It's a huge, huge issue for soil organisms. Tillage is bad for the soil.

One of the foremost experts on carbon is Dr. Rattan Lal of Ohio State University. He suggests that since modern agriculture has happened, we've lost somewhere between 50% and 70% of the original carbon that was stored in our soils. That is an absolutely huge amount of carbon that has been lost to the air, and most of this has been due to tillage.

The United Nations Food and Agriculture Organization, FAO, estimates about a 0.3% loss in annual crop yield due to soil erosion. That 0.3% doesn't sound like very much, but when you take that on a global scale, that works out to losing around 4.5 million hectares of production every year. Four and a half million hectares is nearly 10% of Canada's cropland every year being lost to soil erosion. That's a huge, huge issue.

What we are trying to do on our farm, and what we've been promoting, is no-till practices, trying to keep the soil covered as long as absolutely possible. We've planted cover crops on our farm to try to hold soil in place, to try to provide nutrients back to the organisms in the soil. This is what we're trying to promote in the areas where we can get these things to grow.

As for opportunities, we obviously have work to do to increase no-till acres across the country. There are huge benefits for climate change to going no-till. You're going to use less fuel to get your crop into the ground. You're going to have carbon sequestered in the soil and out of the air. These are win-win situations.

There's an opportunity to gain a better understanding of the costs and consequences of soil degradation. We're not really sure how much degradation is costing us in Canada. There have been some estimates from Dr. David Lobb at the University of Manitoba which suggest that Canada is losing around $3 billion—that's billion with a "*b*"—per year in lost production due to soil degradation, so there obviously is still work to be done to maintain our soil health.

Research needs are constantly evolving. We need to work harder to bridge the gap between the research folks and the producers who are trying to use this research. Extension at Agriculture Canada isn't anywhere near what it used to be. There's incredible research being done at all the centres across Canada, but farmers aren't hearing about it as quickly as they should. I live an hour and a half from the Ottawa centre, and I hear hardly anything about what's going on. We have to improve communications between researchers and farmers.

● (1645)

We have to get some extensions and demonstrations out to the producers, host field days. Farmers will adopt technologies when they see that they work, especially if you take them to their peers who have tried them. You have to get this stuff out to their peers. That's very, very powerful for farmers.

Unfortunately, we still see some great information that sits on shelves and never gets out to the folks who could make good use of it. Producers really do want to do the right thing. However, change is very slow to happen, and most don't realize how detrimental some of those conventional practices and conventional tillage are to the soil.

We have a couple of very simple recommendations for the committee to consider.

The first is to make soil conservation health a key commitment under the Canadian agricultural partnership. The new Growing Forward 3, or whatever you like to call it, is coming out in April 2018. This is the time to make sure that soil health and soil conservation play a key role in that very large agreement.

The second is to work with stakeholders to develop a long-term national strategy on how to better promote soil conservation and improve soil health. The Province of Ontario has recently launched its soil health and conservation strategy. We would encourage the federal government to look into doing something very similar.

Third is to provide some funding for a national study to reassess the cost and consequences of soil degradation in Canada, with an emphasis on greenhouse gas implications, and to enhance the knowledge and demonstration and dissemination of this knowledge, and the latest BMPs, best management practices. There are some great best management practices being developed at Ag Canada and other research stations that need to get out to producers. We need more funding to get those extension people out there to show these things.

We have a final thought. It's a quote from Maya Angelou, a poet from the United States. She said, "Do the best you can until you know better. Then when you know better, do better." That is very, very apt for agriculture. Farmers are trying their very best to do the best they can. They need to learn that there are better ways to do things, and they will adapt.

Thank you very much.

● (1650)

The Chair: Thank you.

I must apologize. We will distribute this document, but it was only in English. We have to translate it first, and then we will distribute it to all the members.

Also, Mr. Tim Nerbas of Saskatoon, I think that was Mr. Longfield's—

Mr. Alan Kruszel: That was ours, Mr. Chair.

He was supposed to join us by video conference, but there was an issue with the video conference in Saskatoon.

The Chair: Okay, thank you.

Now we'll move to USC Canada.

You have 10 minutes, and you can split your time if you wish.

Mr. Martin Settle (Executive Director, USC Canada): Thank you very much.

Members of the committee, parliamentarians, staff, and guests, we want to thank you for this opportunity to speak to you about biodiversity as a key strategy for climate resilience as well as a best management practice for the stewardship of our soil and water resources. I particularly want to speak to it as modelled by some of our work at USC Canada.

I am pleased to be here with Geneviève Grossenbacher, our program manager for policy and campaigns at USC Canada, who is herself an ecological farmer based just north of Ottawa.

USC Canada is a Canadian success story. You may know of us. We were founded by Lotta Hitschmanova as the Unitarian Service Committee back in 1945. We've inspired generations of Canadians to contribute to issues of global concern. Our work on agricultural biodiversity overseas has in part been funded by Global Affairs Canada since the early 1990s. Our work with Canadian farmers is much more recent. It was launched in 2011 and is funded by The W. Garfield Weston Foundation and by donations from individual Canadians.

We're here primarily to ask the Government of Canada to support programs that conserve and enhance on-farm agricultural biodiversity. That biodiversity is our most precious resource, and it provides the best insurance policy for managing the uncertainty and risk presented by our changing climate.

I am an accountant by training. In finance and investment, we are advised to maintain diversified portfolios. Diversified portfolios reduce risk, and they ultimately lead to the most consistent long-term success. That same principle holds true in agriculture. Biodiversity simply provides for resilience.

This is actually the nature of genetics. Seeds are tiny packets of potential. They contain some traits that we can see, but others, such as the ability to survive drought or the resistance to pests or disease, appear only when a plant experiences stress. The more biodiversity we keep in our seed supply, the more likely it is that our crops will have the traits they need for a wide range of conditions. But biodiversity is not static. Selecting the best seeds, saving them, and replanting them the following year keeps those crops evolving and adapting as the conditions change around them. The more diversity of seeds farmers can access and the more diverse traits these seeds have, the better Canada's food supply can adapt to climate stresses.

A broad range of plant genetics can ensure that crops yield good harvests even in challenging conditions, but biodiversity in and of itself is not enough. As we think about our agricultural methods, we must also pay attention to the health of the soil ecology and water systems that are quite literally at agriculture's roots.

Evidence is growing that the integration of biodiversity practices within ecological agricultural systems provides significant benefits to the health of water and soil. The IAASTD—if you don't know that acronym, you can ask Gen to explain it later—report from 2008 was one of the first broad reviews of scientific literature that came to that conclusion. More recently, the International Panel of Experts on Sustainable Food Systems, IPES-Food, published a report entitled "From Uniformity to Diversity", which references many studies that provide a comprehensive argument for farms of all scales to employ biodiverse ecological techniques. The benefits of such an approach include: strong potential for carbon sequestration; increased diversity and quantity of beneficial microbiotic organisms in the soil; improved water absorption and retention; decreased runoff and contamination of surface and groundwater; and increased species diversity of plants, insects, and birds in surrounding ecosystems.

The authors of the IPES-Food study describe a virtuous, positive feedback loop created within biodiverse ecological agriculture and leading to continued improvements in soil fertility, productivity, and ecosystem health, while providing secondary benefits to communities downstream. These improvements and benefits all lend themselves to supporting the adaptive resilience of our food production, farmers, and rural communities as we move into this era of climate change.

● (1655)

This is a unique moment. Yesterday COP23 opened, reminding us of the significant climate commitments Canada has made as part of the Paris climate agreement. The launch of the new Canadian agricultural partnership and the development of a food policy for Canada presents an opportunity for Canada to launch programs that incentivize agricultural innovation toward addressing climate change. We must seize this opportunity to support on-farm biodiversity.

USC Canada's Canadian field program, the Bauta Family Initiative for Canadian Seed Security, is a model for how Canadian farmers can work together to adapt to the impacts of climate change. Through participatory plant breeding, farmers are developing new seed varieties that are locally adapted and perform well in low-input conditions. This low-cost approach to genetic innovation can have a significant impact. For example, in partnership with the University of Manitoba over just the last five years, farmers in our program have been developing wheat varieties selected for their heterogeneity and their performance in low-input environments which, when tested against conventional varieties, show greater early vigour, better disease resistance, and greater concentration of micronutrients, all the while being competitive on yields in both drought and flood years.

To gain the benefits of biodiverse agriculture, research and investment cannot be focused on single traits within limited varieties of a very few crops. Innovation and adaptation must happen across the breadth of crops used in agriculture. Participatory plant breeding, putting the leadership for crop diversification back into the hands of farmers, ensures that the scope of breeding work encompasses many more varieties and allows for innovations to adapt to the specific local context. The 184 farmers engaged in our participatory plant breeding program have adapted over 400 different varieties to local growing conditions, ranging from Vancouver Island to Cape Breton and Newfoundland, and to the extreme north in Alberta. The process is replicable and scalable, and does not require huge financial resources. It can, however, have enormous impact by keeping diversity alive and adapting to new conditions, and creating new diversity through innovative farmer-research partnerships.

USC Canada has been working with farmers in marginal environments around the world for more than three decades. We know that many of the challenges of agricultural practices, soil erosion and degradation, high levels of water consumption, contamination, declining input efficiency, and even financial vulnerability, all of these can be mitigated by embracing biodiversity and supporting ecological practices. To this end, the Government of Canada should support programs that conserve and enhance on-farm agricultural biodiversity and, more specifically, invest in systems of knowledge development and transfer, like participatory plant breeding, to continue expanding agricultural best practices and to develop new varieties of climate-resilient crops.

USC Canada has been innovating on the ground with farmers and researchers for many years. Our experience substantiates expert findings that biodiversity and ecological practices are essential to feed communities today, and to protect the soil and water resources we need to feed future generations. We hope your findings will contribute to creating an enabling policy environment to support our work and those of others in our field, to make Canada a world leader in on-farm research for food security and climate adaptation.

Thank you very much.

● (1700)

The Chair: Thank you, Mr. Settle.

We'll begin our question round, which is for six minutes.

[*Translation*]

Mr. Berthold is going to share his time with Mrs. Boucher.

Mr. Luc Berthold: Yes, I am, Mr. Chair. Thank you.

Mr. Kruszel, this question is for you. I liked your presentation very much.

According to the Soil Conservation Council of Canada, at the moment, human activity causes much more damage to soils than climate change.

Mr. Alan Kruszel: Is human activity causing problems? Yes. Are there solutions? Certainly.

Mr. Luc Berthold: Is the damage to the soil mainly caused by humans cultivating it or does it come from the climate change we are facing? One of the questions we are dealing with here is the effects of climate change on the soil. But you have talked a lot about the effect of human activity on the soil.

Mr. Alan Kruszel: Yes.

Mr. Luc Berthold: A lot of farmers are still using traditional methods of tillage. Why do they continue to use them? It's a good question. it is probably because they have production requirements that could not be met otherwise.

As Chair of the Soil Conservation Council of Canada, do you consider that most negative effects on the soil come from human activity, not from climate change?

Mr. Alan Kruszel: It is human activity. The most important factor is the destruction of organic matter in our soil. If we are able to recover the organic matter and enrich our soil with carbon from the air, it will mitigate the effects of climate change.

Mr. Luc Berthold: Have you done any studies on climate change?

Mr. Alan Kruszel: No, not yet.

Mr. Luc Berthold: So it is not yet a priority for the Soil Conservation Council of Canada.

Mr. Alan Kruszel: Correct. We are trying to promote zero tillage as a way to face up to climate change better. If we can put in more organic matter, the yields will be more stable. If there is too much water, the water can drain away more quickly. We can have yields even during droughts. We really have to promote the health of the soil in order to help us face up to climate change.

Mr. Luc Berthold: So your organization has conducted no studies.

Mr. Alan Kruszel: Right.

Mr. Luc Berthold: Let me turn to you again, Ms. Lee.

You talked about the carbon tax. You are asking for an exemption in order to use natural gas and propane. In your industry specifically, any increase in costs or any form of tax can have really disastrous consequences.

Ms. Rebecca Lee: Correct.

I will ask my colleague to respond about the use of natural gas and propane.

[*English*]

Mr. Jan VanderHout: It's important to recognize that greenhouse production is very much a part of agriculture. To produce the greenhouse crops that we grow, we need to burn fossil fuels. We cannot do without that in this food production.

We also are impacted significantly in our competitiveness because we have the extra cost of carbon pricing—cap and trade or carbon tax—which is a significant problem. We are not asking for an exemption from all carbon tax. We are seeking an exemption only in the fuel we use to grow our crops. Much like the diesel fuel for outdoor agricultural production would be exempt, we would like, in greenhouse production, an exemption from our cost of carbon pricing on natural gas, propane, or heating oil.

[*Translation*]

Mr. Luc Berthold: An exemption like that would encourage greenhouse owners to use propane and natural gas rather than diesel.

● (1705)

[*English*]

Mr. Jan VanderHout: It would be if they were able to use the natural gas to run other equipment as well, certainly. Part of this is just to recognize the work that we've already done. That includes the installation of high-efficiency boilers, condensing boilers, and energy curtains in the greenhouse to retain the heat that we're putting into the greenhouse. We also do energy audits and these sorts of things.

Energy is a very big cost for greenhouse operators. We're looking for ways to save on that. The cost of the fuel is the incentive to do that.

[*Translation*]

Mr. Luc Berthold: I will let my colleague Mrs. Boucher ask the final question.

Mrs. Sylvie Boucher (Beauport—Côte-de-Beaupré—Île d'Orléans—Charlevoix, CPC): Thank you, everyone. This is very interesting.

I have a number of questions to ask, but I am going to turn to the Canadian Horticultural Council.

Can you explain to me why it is so important for the vitality of Canada's agricultural sector to harmonize our policies on carbon pricing with those of other countries?

[*English*]

Mr. Jan VanderHout: To my knowledge, none of the countries that we compete with have anything like carbon pricing. The countries that we compete with, the United States of America, Mexico, and South American countries, have nothing like carbon pricing.

The Chair: Thank you, Mr. VanderHout.

Thank you, Madame Boucher.

Mr. Longfield, you have six minutes.

Mr. Lloyd Longfield: Thank you.

I'd like to do down that road a little bit further in terms of carbon pricing and look at the new clean fuel standard and the opportunity to use biofuels, ethanol in diesel and gas, renewable natural gas, and other fuel options. I'm wondering if anyone can comment on that, across the board, just very briefly.

Biofuels: going once....

Ms. Geneviève Grossenbacher: Could you just repeat that. It was biofuels and....

Mr. Lloyd Longfield: It's about looking at the use of biofuels, the new clean fuel standard that Canada is developing so that we can reduce our carbon footprint.

I'm going to switch, because of our time.

On the carbon management, one thing I saw at the conference in Guelph was comments being made around putting a price on carbon as a way of managing carbon and managing the carbon cycle.

Mr. Kruszel, at the conference there was representation from the United States and from all across Canada. They were talking about the importance of pricing carbon in terms of managing the carbon cycle. Do you have any comments on that?

Mr. Alan Kruszel: Certainly, pricing carbon incentivizes change on the agricultural landscape, in particular, if you can do some kind of offset system or something where farmers get paid to sequester carbon.

Mr. Lloyd Longfield: Right.

Mr. Alan Kruszel: Our concern would be, once that happens, what incentivizes them to keep it there?

Mr. Lloyd Longfield: Right.

Mr. Alan Kruszel: We've seen that, occasionally, with other systems, not necessarily carbon, but somebody gets a payment to do something, it's great, and it lasts for a couple of years, but then once the payment disappears, they revert to what they were doing previously.

Mr. Lloyd Longfield: The habit goes away.

Mr. Alan Kruszel: There has to be some way to continue that, either a payment or something, to make sure that the change actually stays in place, to make sure that carbon stays secure.

Mr. Lloyd Longfield: In terms of sustainability of the program, you need to have a cycle on the carbon cycle as well so that it continues.

Mr. Alan Kruszel: That's right.

Mr. Lloyd Longfield: Ms. Grossenbacher, we spoke before this session started about the role of women. Your organization has really been a leader in empowering women in the developing world, and we spoke about the change that has had not only on agriculture, but also on the approach to sustainability.

Could you comment on the role of women in this whole discussion?

Ms. Geneviève Grossenbacher: It's a great question, actually. I'm glad you raised it.

We do work with women in agriculture across the world and in Canada. In fact, what we found is women are incredible at saving biodiversity. They're incredible at agriculture. They make up most of the agricultural force abroad. In Canada, we sometimes tend to forget it, but actually.... I'm also very much involved with a lot of new farmers. In that segment of the population, new farmers who are starting—and in more sustainable forms of agriculture, I should say, also—they are predominantly women.

Women play a huge role in feeding us now and will in feeding us tomorrow, I really believe. Just to go back to seed diversity in Canada, again, they've been key at keeping old heritage varieties and improving the varieties that grow well in their community.

Martin, maybe you would like to expand on that. They're absolutely essential, and right now, unfortunately, programs aren't always designed to recognize their contributions.

● (1710)

Mr. Lloyd Longfield: As you're saying that, I'm thinking of indigenous women, first nations, and the role they play in protecting water and promoting the protection of water. Does USC reach into indigenous communities as well? Can that be part of our study?

Mr. Martin Settle: We're very cautious about how we approach indigenous communities. We are, ourselves, not an indigenous organization and we want, as part of ensuring that we play an appropriate role in reconciliation, to work to ensure that leadership in indigenous communities comes from indigenous people. That said, there are a significant number of people within the indigenous community who are leaders in their communities in sustainable agriculture, in reclaiming some of the traditions that have been lost through the years, even in terms of restoring some of the historical traditional crops that are there.

We would certainly be very open to continuing to explore and go deeper in terms of our relationship with indigenous farmers, while recognizing that we are not going to be the leaders. We hope that the government can also be a leader in that reconciliation process.

Mr. Lloyd Longfield: The nation-to-nation approach is really what we're focusing on as a government, as well.

I'll go to Mr. Kruszel, again.

On the biodiversity of crop cover and trying to manage the top layer of carbon, trying to increase carbon or put carbon back into the soil that we've lost over many years, could you comment on the diversity of crop cover as an important part of our strategy going forward?

Mr. Alan Kruszel: For sure. Diversity of crop cover is obviously very important. We promote, very strongly, crop rotation. In Ontario, where I am from, crop rotation is not phenomenal. We have a lot of corn, soybeans, corn, soybeans. That's not a crop rotation. We'd much rather see a three or four crop rotation. On my farm we have a three crop rotation and then we plant covers with things that aren't normally in my rotation. We have, in our multispecies cover crop mix, buckwheat, peas, all kinds of things that we don't normally plant as a main crop but are just there to provide some biomass to go back into the soil.

The Chair: Thank you, Mr. Longfield.

Thank you, Mr. Kruszel.

[*Translation*]

Ms. Brosseau, you have six minutes.

[*English*]

Ms. Ruth Ellen Brosseau: Thank you, Chair.

I would like to thank all the witnesses for their presentations and the exchanges we've had so far.

I think what is really important is research and innovation. We know that in 2016 the federal government, Agriculture and Agri-Food, invested $649.5 million in agricultural research, which is very good, but $1.6 million went to organic, which is 0.25% of the R and D budget.

We know our trading partners invest a lot in research and innovation. I was wondering if we could get some comments around the need to invest in research and innovation.

Ms. Geneviève Grossenbacher: Again, I love that question, so thank you.

Indeed, there is such an imbalance in research and development, and I think that needs to be fixed, because a lot of the great innovation leading us towards more sustainable practices is coming from ecological agriculture, partially through organic agriculture. Yet, when we only invest a quarter of one per cent in R and D for organics, especially when we know the organic sector in Canada is growing at an incredible rate.... It is now maybe only 2.7% of the market, but it's growing rapidly, and whatever comes out of organic research can be applied to all farmers. A lot of the best practices in terms of crop rotation diversity came out of organic agriculture.

Again, just to bring it back to seeds, that imbalance in research is definitely there. There is virtually no investment in plant breeding for seeds. All of the attention is going to genetic engineering or plant biotech. That needs to happen, but the sector of organic plant breeding is incredible. We have had great results in Canada showing that the seeds developed to perform well without inputs perform well both in years of drought and in years of flood when compared to conventional cultivars. Now, that is great for organic farmers, but those seeds could also be applied to conventional farmers to help reduce how much pesticides or fertilizers they use, and fertilizers are also a great source of greenhouse gas emissions in agriculture.

All that is to say that I think we need to invest in Canada. The biggest investment I remember from Canada was a $22-million investment last year in grains in the Prairies. We'd love to see an investment, not necessarily at the same scale, in organic agriculture, plant breeding.

● (1715)

Ms. Ruth Ellen Brosseau: I saw a lot of heads nodding.

I don't know if I can get some more comments about the need to invest in research and innovation.

Mr. Jan VanderHout: I totally agree with you that it's really important to invest continually in research and innovation. I also support the idea of putting more emphasis on organic, because certainly there is a huge overlap of opportunity for commercial growers to apply those technologies.

On our farm we do a lot of work with biological controls, such as beneficial insects and organic registered pesticides for fungus control, that will not impact our beneficial insect population. More research in that direction would help us move towards a more sustainable future.

Ms. Ruth Ellen Brosseau: Mr. Alan Kruszel, do you have any comments?

Mr. Alan Kruszel: I do for sure. Anything that increases research and innovation funding for agriculture, in our view, is a win. There are lots and lots of opportunities. What we unfortunately see, as I mentioned in my presentation, is a lot of research happening but not getting out to the farm population. That's a huge issue. If we're spending $650 million, it would really be nice if all of that made it out to the farming population so that everybody knows it's there.

There's another thing we'd like to see. Of course, research and innovation is good, but with a lot of the programs, like the previous Growing Forward program, innovators on the farm are taking risks all the time, but none of the programs will compensate them for taking those risks.

The programs are inherently designed to take the ideas of the innovators and then help bring on the rest of the farming population with incentives. The really early innovators don't get any incentive at all to do these things, and that's something we should change. They're taking enormous risks trying new things on their own. It could be thousands or, in some cases, millions of dollars' worth of investment to try something that may not work. They really should have some kind of funding assistance to help them mitigate their risks.

Ms. Ruth Ellen Brosseau: Just to paint a portrait, the United States recently announced $56 million for investment in research and innovation for organics. I hope the government's ears are open and they're listening, because we are going to have that new framework coming up.

There's another question I would like to ask, if we can go back to USC. It's about how the participatory plant breeding model works and how important it is to involve farmers in that. Does the government currently have programs that put an emphasis on soil fertility, on clean...and on enhancing our biodiversity?

Ms. Geneviève Grossenbacher: Again, those are two good questions.

On the $56 million, I want to add something. In the previous presentation, Mr. Drouin, I think, mentioned that we need to level the playing field. I think it's the same in this type of thing. The U.S. and Europe are investing in organic agriculture, and Canada, I think, can lead the way also.

In terms of plant breeding, the same thing is happening. The U.K. and the EU both have developed programs that are based on our programs in Canada. In the case of the EU, they invested in two programs—one at $3.5 million and one at $7 million—in participatory organic plant breeding. We would love to have something similar in Canada.

Going back to what you were just saying about the knowledge transfer, we couldn't agree more that farmers need to be involved in the knowledge transfer. We need extension agents, but also we need research that takes farmers into account. This is where the participatory aspect is so important.

Participatory plant breeding is designed around the farmers. Farmers are at the core, the centre, of the work. They help to establish the goals of the program. They help to decide what works, what doesn't work, and what criteria they want, so that in the end, they get a product that they want, that works on their farm, and that adapts every year to the local growing conditions. This is really a great thing that we should be investing in. With the work we've been doing in Canada, Canada has established a really successful model that other countries are turning to—

● (1720)

The Chair: Thank you, Madam Grossenbacher. We've actually gone a little bit over the time. I'm sorry about that.

[*Translation*]

Ms. Nassif, you have six minutes.

Mrs. Eva Nassif (Vimy, Lib.): Thank you, Mr. Chair.

My thanks to the witnesses for their presentations. Each witness has really helped us to understand their area better.

Mr. Kruszel, you talked about research. What kind of research are you suggesting? Who is in the best position to do this research on soil conservation?

Mr. Alan Kruszel: If I may, I will answer in English. It is a little easier for me.

[*English*]

Mrs. Eva Nassif: Yes, no problem.

Mr. Alan Kruszel: What kind of research are we looking for? Certainly, we need soil health research. There is some soil health research going on. There could be an awful lot more.

I mentioned that one of the things we would really like to see is in terms of the costs and consequences of soil degradation. We talked about this number of $3 billion per year being lost because of soil degradation. That is an on-farm cost only. We don't have any information at all about how much it costs to clean out the creek in terms of all the soil that's landed in the creek, or how much it costs to re-dredge the seaway because of the soil that's landed in there.

For all of this stuff, we need some really good numbers. We're sure that it's going to be in the tens of billions of dollars. That's something we need to address. If we can put some of that money into programs to help address that, we can try to get more no-till on the ground and try to get farmers to think more about preserving the soil, getting more carbon in the soil, and increasing soil health.

Increasing soil health does a marvellous job at biodiversity enhancement, clean air, and clean water. It all relates back to the soil. If we can get some money on research for soil health, as well as for costs and consequences of the soil degradation, we'd be really pleased.

[*Translation*]

Mrs. Eva Nassif: Now I would like to talk to Mr. Settle.

Can you list for us the adverse effects of climate change on soil quality in Canada. Is it possible to remedy it, in your opinion?

[*English*]

Mr. Martin Settle: I'll defer to Gen, just because she has the much more practical experience, but I think one of the things to keep in mind is—

[*Translation*]

Mrs. Eva Nassif: Is that because she is a woman?

Voices: Oh, oh!

Mrs. Eva Nassif: That is what you said just now. I am not saying it because I am a woman, but I am a feminist.

Go ahead, Ms. Grossenbacher.

Ms. Geneviève Grossenbacher: There are a number of impacts on climate change. Some good studies have also been published on the subject, including one called "From Uniformity to Diversity" by IPES-Food. I have some copies with me and I can leave them with you.

Climate change certainly has many effects on soil biota, the micro-organisms in the soil. Hence the importance of protecting it even more. There are a number of ways of protecting the soil, but we really believe that the best practice is to increase diversity.

Earlier, we also talked about carbon in the soil. Carbon comes in different kinds. When we talk about working the soil, we are talking about surface carbon, which is important. But even more important is the carbon under the surface, meaning the carbon that is found at greater depth. How do we go about storing carbon there? By using plants with large root systems, perennials. In French, I think the word is—

Mr. Jean-Claude Poissant (La Prairie, Lib.): *Plantes vivaces.*

Ms. Geneviève Grossenbacher: Yes, that's right. Thank you. We need to use perennials. A lot of interesting research has been done on the topic. Plant diversity is really crucial. Plants provide the soil with different kinds of sugars and interact differently, hence the importance of biodiversity. Climate change has a direct impact on soil biota and the loss of biodiversity. In a nutshell, it is important to invest in diversity.

Mrs. Eva Nassif: My question is also about climate change. Perhaps Mr. VanderHout could answer it.

One of the priorities for the new Canadian Agricultural Partnership will be to help industry to use research and innovation to improve resiliency and increase productivity. Other priorities will be to reduce greenhouse gas emissions and to adapt to climate change.

What potential do you see in those priority activities in improving resiliency in the agricultural sector?

[*English*]

Mr. Jan VanderHout: I think you're talking about how we can improve our environmental performance, our carbon footprint, in the greenhouse sector. I think there are future possibilities for doing that. As a grower, my opinion is that the biggest opportunity for improving our environmental performance, in particular our carbon output, is humidity control. A lot of energy is used to manage humidity. Unfortunately, right now that technology is still emerging. When we talk about innovation in Canada, that could be a spot where there's an opportunity for us to be leaders internationally in the control of humidity, in the reduction of humidity in particular, in the greenhouse.

● (1725)

[*Translation*]

Mrs. Eva Nassif: Mr. Kruszel, what are the main concerns of your sector in terms of improving resiliency and adapting to climate change?

Mr. Alan Kruszel: Do you want to know what my priorities are?

Mrs. Eva Nassif: Yes.

Mr. Alan Kruszel: Improving the health of our soils would help us enormously in increasing their resiliency and productivity. We also need to see if it possible to promote zero tillage more, a technique that involves planting, without working and tilling the soil.

The Chair: Thank you, Mr. Kruszel.

Mr. Poissant, you have six minutes.

Mr. Jean-Claude Poissant: Thank you, Mr. Chair.

My thanks to the witnesses. Talking about agriculture is always interesting. I was a farmer for more than 40 years.

A farmer is a steward of the land, for sure. The most important thing for him is to pass on an economically viable business, with quality soil. Farming now uses a lot of technologies. But we still see growing resistance to herbicides and pesticides.

Is there currently a way of determining whether soil has degraded over the last 20 years?

Mr. Alan Kruszel: You want to know whether there is a way to find out whether our soils have degraded in the last 20 years?

Mr. Jean-Claude Poissant: Yes.

Mr. Alan Kruszel: In our view, you would have to measure the organic matter in the soil. We are talking about its structural stability. Soil is made up of little pieces.

Mr. Jean-Claude Poissant: Yes.

Mr. Alan Kruszel: You have to see whether they dissolve immediately when they are put in water or whether they remain intact. If they remain intact, it indicates true stability and that is very good. However, if the soil has been worked a lot and lacks organic matter, the pieces dissolve in water immediately and become mud. So yes, in a word, it is possible to measure it.

Mr. Jean-Claude Poissant: So can you assess today the extent to which soil has degraded in the last 10 or 20 years?

Mr. Alan Kruszel: Most farmers take soil samples and analyze the organic matter. At home, I have seen a 1% increase in organic matter since we began to go to zero tillage. It is quite incredible. Normally, you hope for an increase of 0.1% or 0.2% in two or three years, but, on my farm, I have seen an increase of 1% in 10 years.

Mr. Jean-Claude Poissant: I know how important crop rotation can be, but also tillage rotation. Have you looked at that issue before?

Mr. Alan Kruszel: Our council is really trying to reduce tillage and working the soil. If we could find a zero tillage system for all crops it would be fantastic, but I have not yet found one for potatoes. Zero tillage does not work for potatoes. It is still difficult for vegetables, carrots for example.

There are ways to enrich soil to minimize the damage of all the work on it. You put in cover plants after the potato harvest. It is already being done in New Brunswick, in Prince Edward Island, and everywhere. You try to cover the soil with something living after the harvest. It helps us to replenish our soils.

Mr. Jean-Claude Poissant: To replenish the soils, you can rotate four or five crops, as was said earlier. That would be the ideal.

There is less livestock. The manure they produce help to keep the soil healthy by adding organic matter.

We are hearing about city sewage more and more. What do you think about it?

● (1730)

Mr. Alan Kruszel: The Council is not opposed to city sewage being used on the land. Scientists tell us that it is good for the soil. It adds nutrients and organic matter to the land.

Of course, the sewage has to be properly managed. Ontario, for example, has regulations about the amount of sewage, how many litres of cubic metres of sewage can be spread near setback zones, waterways, wells and so on. If it is done properly, we do not see a problem.

Mr. Jean-Claude Poissant: Finally, do you think that the government should take steps to encourage farmers to rotate their crops or the way they work the soil?

Mr. Alan Kruszel: That would be a very good idea, because we have to show people that it is feasible.

At home, we only have three or four crops, but we do rotate them. We put in cover plants to try to make up for it. I have not yet found a market for hay. It does not work. I do not have the machinery I would need and I have no desire to invest in it. I am not good in that area. It rots in the field. So I am going to stick with my major crops.

If a way could be found to promote planting cover crops with major crops, it would really help us.

The Chair: I am going to make a final comment and put in my two bits' worth, so to speak.

As a farmer and an organic greenhouse operator, I would like to go back to what Ms. Grossenbacher said about research on varieties.

In my experience, which is starting to be lengthy, there are varieties that the large company mergers have taken out of the market. Those varieties still had unique characteristics, especially in taste, and they fit well with the conditions of my operation. But now you have to ask for an exemption each year because no organic variety would be acceptable.

I entirely agree that we have to invest in varieties. We must not lose them just for the benefit of large companies that will control them, take them off the market, and replace them with their own.

That is my final comment.

Thank you all.

[*English*]

Mr. John Barlow: I want to quickly, for my colleagues, table a motion I'd like to discuss on Thursday, if possible.

The Chair: Sure, table it. Thanks.

The meeting is adjourned.