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Chair: Mr. Kody Blois



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• (1100)

[*Translation*]

The Chair (Mr. Kody Blois (Kings—Hants, Lib.)): I call the meeting to order.

Welcome to the 11th meeting of the Standing Committee on Agriculture and Agri-Food.

I will begin with a few reminders.

Today's meeting is taking place in a hybrid format pursuant to a House order of November 25, 2021. The proceedings will be made available on the House of Commons website. For your information, the webcast will always show the person speaking rather than the entirety of the committee. Screenshots or taking photos of your screen is not permitted.

[*English*]

For members participating in person, keep in mind the Board of Internal Economy's guidelines for mask use and health protocols.

To our witnesses who are joining us virtually, this is not your first rodeo, as they say. I'm quite sure we've seen most of you here. In terms of interpretation, you have those availabilities on the screen. Please make sure that you do have your headset ready to go when we get started.

Pursuant to Standing Order 108(2) and the motion adopted by the committee on Monday, January 31, 2022, the committee is commencing its study of the environmental contribution of agriculture.

I would now like to welcome our witnesses for our first panel.

Joining us by video conference today we have, from the Agriculture Carbon Alliance, Dave Carey and Scott Ross, both of whom serve as co-chair.

From the Canadian Federation of Agriculture, we have Keith Currie, who serves as first vice-president, and Frank Annau, director of environment and science policy.

[*Translation*]

We are also hearing from the representatives of the Union des producteurs agricoles, or UPA, Martin Caron, general president, and Daniel Bernier, agricultural research and policy advisor on the environment.

[*English*]

Each of you will have up to five minutes for opening remarks.

I would invite Mr. Carey or Mr. Ross to make a five-minute opening statement on behalf of Agriculture Carbon Alliance.

Mr. Dave Carey (Co-Chair, Agriculture Carbon Alliance): Thank you, Mr. Chair.

Thank you for the invitation to appear today on behalf of the Agriculture Carbon Alliance or ACA.

My name is Dave Carey. I serve as co-chair along with my colleague, Scott Ross, who I will be splitting my time with.

ACA is a first-of-its-kind coalition of 14 national farm organizations that unites every major commodity and collectively represents more than 190,000 farm businesses and \$76 billion in farm market receipts in 2021. The ACA was established to ensure that Canadian farmers' sustainable practices are recognized through a policy environment that supports their livelihoods and leverages their role as climate solutions providers.

It is imperative that environmental policies are developed in collaboration with producers to ensure that the government understands their realities and that policies and programs can actually be implemented by producers to benefit the environment and ensure their businesses remain competitive.

We founded the ACA in 2021 because farm groups weren't viewed by ECCC as relevant stakeholders, despite agri-environmental policy development being a significant focus of the department and the government as a whole.

We would request that a formal working group be struck between AAFC and ECCC, with representatives from primary agriculture, to work on pragmatic and practical policy development.

We share the government's goal of a more sustainable agriculture sector, but are seeing a deterioration in stakeholder engagement. Resulting draft policies developed by regulators are not practical, reasonable or implementable by farmers and ranchers as they look to continue to produce low-cost, high-quality food for Canada and the world.

I will now pass it over to Scott Ross for the remaining time.

Mr. Scott Ross (Co-Chair, Agriculture Carbon Alliance): Thank you, Dave.

ACA also works proactively on behalf of Canadian agriculture to advocate for constructive and evidence-based environmental policies. To date, we have focused on three major priority areas.

Carbon offset protocols open to science-based measurement should incorporate flexibility to recognize incremental improvements in on-farm practices that have already taken place and will take place, while accommodating advancements in verification that would allow for more outcome-based measurements.

ACA welcomes the opportunity for targeted producer engagement on the enhanced soil organic carbon protocol. We also look forward to engaging on future protocols for livestock feed management, the avoided conversion of grasslands, 4R climate-smart offset protocols and livestock manure management.

We understand that the proposed offset protocols will not apply to farms that began those activities prior to 2017. However, we do not believe that this should serve as a barrier to recognizing early adopters for their contributions to the sector. Instead, protocols and support programs should also be developed for producers who were early adopters of best management practices. Protocols or direct payment for long-term carbon storage would help ensure that this critical ecosystem service is recognized for its vast contribution to on-farm environmental efforts.

On research and rebates, the climate action incentive fund returned a portion of revenue collected by the carbon tax for rebates and retrofits that reduce carbon emissions for small and medium-sized enterprises. Farms were the largest pool of applicants demonstrating their commitment to climate action. Unfortunately, CAIF has not been open for applications since 2019, and our members are looking for clarity on the future of this program.

The ACA also welcomes the opportunity for further engagement on the agricultural climate solutions program. The government should ensure that living lab sites are expanded to the west, for example, where mounting climate extremes are having profound impacts on producers.

In conclusion, farmers and ranchers continue to face rising costs for producing food, particularly inputs and transportation. These costs are compounded by the carbon surcharge. Farmers and ranchers are required to dry their grain, and heat or cool their barns and greenhouses in order to feed Canadians and drive our export market. These are the very activities needed to mitigate the impacts of climate change, including drought and extreme rainfall. With no alternative fuel sources available, these necessary practices are penalized by an increase in the price of carbon. As such, amendments must be made to the Greenhouse Gas Pollution Pricing Act to extend exemptions for qualified fuel to marketable natural gas and propane, and include machinery used for grain drying, irrigation and heating and cooling of livestock barns and greenhouses.

Farmers are environmentalists and have been improving their sustainability for decades through innovations and BMPs. With record fuel prices, there are already strong incentives to invest in fuel efficiency, but farmers need to have available capital to be able

to make investments in improving their operations, which are often very expensive and can amount to hundreds of thousands of dollars.

By adopting policies that support competitiveness, the government will ensure that farmers can further invest in the sustainability of their operations, leveraging the sector's potential to lower emissions and sequester carbon. As such, ACA and our members are strong supporters of Bill C-234 and would encourage all members to support the bill and expedite its review at committee stage.

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

• (1105)

The Chair: Thank you, Mr. Ross.

We're now going to move to Mr. Currie from the Canadian Federation of Agriculture for five minutes, please.

Mr. Keith Currie (First Vice-President, Canadian Federation of Agriculture): Thank you.

I'm Keith Currie. I'm the first vice-president of the Canadian Federation of Agriculture. We represent some 200,000 farmers, ranchers and farm families nationwide. I'm joined by Frank Annau, our director of environment and science policy.

We appreciate this opportunity to discuss how to continue the hard work of farmers on reducing emissions and improving soil health. Producers are stewards of the land, and manage significant carbon sinks that play a key role in soil health and the fight against climate change.

These sinks are maintained by a number of farm-driven practices that regenerate soil organic matter, which in turn improves carbon sequestration and long-term carbon storage in agricultural soils. These practices are wide ranging, but can include intercropping, cover cropping and rotational grazing, all of which are eligible for funding under the on-farm climate action fund.

With Canada being as large and as vast as it is, the success of these approaches can vary by region, and it is critical that initiatives, such as living laboratories, expand to western Canada, so that innovations in soil health can be refined in areas hit hard by recent flooding and drought.

Farmers are also well versed on the environmental and cost reduction benefits of efficiently managing critical inputs, such as fertilizers, fuels and pest control products.

As you may be aware, industry-led approaches, such as 4R nutrient stewardship, help producers select the right source of fertilizer to apply the right amount in the right place at the right time.

Research shows that correct implementation of this protocol results in a 15%-25% reduction in nitrous oxide emissions. These efforts can be greatly enhanced by precision agricultural technology, such as crop and soil sensors, that optimize the rate of fertilizer, pesticide and weed control application. This, combined with practices that regenerate soil organic matter, help prevent our overapplication of inputs, which protects soil biodiversity and improves soil health.

Precision ag technology also significantly improves fuel efficiency by using fleet analytics and auto-guidance systems, which reduces the number of passes needed for sprayers, tillage and harvesters. One U.S. study found that this would decrease fuel use by up to 6%, which is the equivalent of 18,000 flights. The same study stated that this fuel use could decrease a further 16% with a broader adoption of this technology.

In Canada, there are a number of barriers to this adoption, including the lack of reliable rural broadband Internet needed to run the equipment, and the fact that adoption rates drop significantly on farms that are under 500 acres in size, or that have an annual income of under \$75,000. As such, it is recommended that government prioritize rural Internet and scaling down this technology in order to realize those fuel efficiencies.

With respect to greenhouse gas reduction, the largest cattle methane reduction study was concluded in Alberta in 2020. It showed that methane emissions per cattle could be reduced by 30%-80% by including an additive called 3-NOP in different combinations of feed. The additive was developed by DSM technologies, which has applied for registration in various countries to bring the product to market in 2022.

Unfortunately, here at home, the product may not be on the market for years, because Health Canada has classified it as a veterinary drug. This puts livestock sustainability efforts in Canada behind countries that have registered the product as animal feed, including EU countries, China and Brazil. We recommend the government follow suit with our trade partners and competitors by ensuring 3-NOP reaches Canadian markets as soon as possible.

All of these solutions, while effective, come at a significant investment and cost to farmers. It is therefore essential that we ensure they have the cash in hand to invest in solutions, and participate in government cost-sharing where available. The cash is being significantly reduced by record high costs for inputs, such as fuel and fertilizer, brought on by Russia's invasion of Ukraine. These events put greater pressure on Canadian farmers to produce more than ever

before to mitigate impacts from a world food shortage brought on by the war. We must ensure farmers have cash resources to rise to this occasion, and to do it sustainably.

The price on carbon acts as a market incentive to switch to lower-emission fuels and improve fuel efficiency. This signal is dwarfed by the blaring alarm of current gas prices. While gas and diesel are exempt from carbon surcharges on farm, natural gas and propane used for grain dryers and livestock heating and cooling systems are not. These activities are critical to mitigating severe climate impacts, such as extreme rainfall and drought.

• (1110)

We therefore recommend support for House Bill C-234. Removing the carbon price on these fuels will provide farms with additional cash to invest in the input efficiency needed to respond to record input prices and help Canadian farmers feed the world.

We thank you for your attention.

The Chair: Perfect. Thank you.

[*Translation*]

We now go to the Union des producteurs agricoles representatives.

Mr. Caron or Mr. Bernier, go ahead.

Mr. Daniel Bernier (Advisor, Agricultural Research and Policy – Environment, Union des producteurs agricoles): Thank you, Mr. Chair.

The president of the UPA does not seem to be at the meeting; he may have had connection issues. So I will make the presentation.

Five minutes to talk about such a broad topic is very little time. So I will stick to the basics.

I would like to begin by saying that environmental protection has been a priority for the UPA for about 30 years. The first agri-environmental strategy was adopted in 1994.

Despite three decades of progress in sound manure management, efficient fertilization, adoption of soil conservation practices and improving pesticide use, we are still facing many challenges. The phenomena causing those challenges are very complex and societal demands are somewhat conflicting.

Agriculture must meet the needs of a growing population in search of healthy and affordable food, produced with minimal inputs, such as fertilizer and pesticides, while reducing its footprint on ecosystems. So we must produce more, but less intensively, all at the lowest price.

That said, many actions can be taken to better protect the environment in the agricultural sector. One of the most significant ones is definitely soil health. Better soil health helps simultaneously address a number of issues: soil fertility improvement, reduced use of fertilizer and pesticides, greater resilience to the impacts of climate change, improved water quality and fighting climate change through carbon storage.

Improving soil health requires a number of good practices to be implemented, such as greater crop diversity in the rotation, introduction of green manure and cover crops, and necessary prevention of compaction.

Concerning the adoption of those practices, introducing less lucrative crops potentially reduces the short-term profitability, while soil health provides medium and long-term benefits. Based on the context specific to each business, the transition period can be difficult, even impossible, to get through.

That is why government has a role to play in supporting producers through that transition, by promoting rewards for the environmental goods and services those practices provide.

Concerning soil compacting, should be pointed out that, nowadays, given the size of farms and the labour shortage, many farmers opt for large machinery. That equipment's axle load often exceeds what experts recommend. Soil damage is insidious, but quite real. Producers still have to be educated about that.

I will provide an example. To avoid this problem, producers could choose two medium-sized tractors rather than one larger one, but that implies the use of a second driver. So the labour shortage may be a barrier to soil health.

When it comes to pesticides, we must focus on integrated pest management, producer training, as well as the availability and cost-effectiveness of alternative solutions. Once again, the government has an important role to play by providing funding for finding solutions and for knowledge transfer. It must also promote the accessibility of alternative solutions whose cost is generally higher. So better risk sharing is necessary.

Finally, I will discuss a crucial issue of our time—greenhouse gas reduction. In Canada, agricultural emissions account for 8.1% of greenhouse gases. Although we can agree that we can reduce the intensity of emissions on a per-unit production basis by changing our practices, we have to keep in mind that we will not be able to eliminate them completely.

Agricultural emissions are unique because they stem from biological processes. Livestock farming activities, manure manage-

ment, crop land, and land fertilization and liming produce greenhouse gases.

Not all tonnes of greenhouse gases emitted are created equal. Feeding the population is a core activity. The greenhouse gases that result from it are an inevitable consideration. In contrast, emissions stemming from air travel for vacation are not essential. We must set our priorities.

Although the agricultural sector is an emitter of greenhouse gases, it is also potentially a carbon sink. Agricultural soils can store carbon as organic matter.

In closing, I want to point out that the UPA, as a recipient of Agriculture and Agri-Food Canada's on-farm climate action fund, will develop a program that will help reward Quebec farmers who adopt beneficial management practices in terms of cover crops and nitrogen management, which help reduce greenhouse gas emissions.

• (1115)

Thank you.

The Chair: Thank you, Mr. Bernier.

I welcome Mr. Caron who, as we can see, is dealing with technical issues. I also want to welcome Mr. Hardie, who is replacing Mr. Turnbull.

We will now go to questions.

Mr. Barlow, go ahead for six minutes.

[*English*]

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

Thank you to our witnesses for being here today and providing us with some excellent information.

I want to start with the Agriculture Carbon Alliance. I think it's such a great organization, to see some of our agriculture stakeholders working together to be proactive when it comes to our agriculture sector and the role it will play in stewardship of our environment. It's certainly an opportunity to highlight some of the incredible things that agriculture has already done. Kudos to this group for getting together and forming this alliance.

I don't know who wants to answer from the ACA, but you mentioned your support for Bill C-234. I know my colleagues across the way will talk about Bill C-8 and the carbon rebate, but we've already seen the report from the Parliamentary Budget Officer that the rebate does not reduce emissions and also is not revenue neutral. In fact, when we see the numbers of \$1.70 per \$1,000 of eligible expenses, it is only a fraction of what producers will be spending in terms of their carbon taxes.

Why is it important to have that full exemption from the carbon tax, which would be provided under Bill C-234, compared to the rebate program that's being proposed in Bill C-8?

• (1120)

Mr. Scott Ross: I can start here, Dave, and if you like, you can build on it.

In answer to your question, the starting point for us is about accessibility of viable alternatives. In the absence of having somewhere to direct how you are approaching fuel emissions reduction, if there isn't a technology available to your farm, it speaks to the lack of efficacy of Bill C-8 and its ability to reduce emissions.

When we look at an exemption, from our perspective, it's responding to the need for an approach that is tailored to individual farm operations. We're an incredibly diverse sector, and each farm has individualized needs that they best understand. By making that capital available to the farmer to inform their own sustainability investments, it ensures that they can make the most effective decisions possible in that regard.

Mr. Dave Carey: I would quickly add that I think there is the acknowledgement that the rebate does not make farmers and ranchers whole from the cost of carbon, which will go up on April 1.

I also want to point out there's a growing amount of evidence, both qualitative and quantitative, that reducing farmers' or ranchers' working capital throughout the year, with the hope of a rebate at the end, is actually a disincentive to making investments on farm to increase their competitiveness and environmental sustainability.

In our respect, the current carbon pricing around natural gas and propane has a reverse impact when it comes to farmers and ranchers, because that working capital is what they would use to invest.

Mr. John Barlow: Thanks for adding that.

Certainly when you claim that on your taxes and get paid back, you'd be paying for those expenses for perhaps 18 months before you got that rebate, whatever the rebate would be.

Mr. Currie, would you mind taking a crack at that as well?

From the CFA's perspective—and I know this was spoken about at your AGM last week in Ottawa—why is it important to have that full exemption from the carbon tax rather than a rebate?

Mr. Keith Currie: I think Dave and Scott highlighted the main key concerns around the exemption versus the rebate.

The other thing I will add is that rebates are an administrative burden on everybody, both farmers and ranchers, but also government. It's very costly to initiate a rebate type of system; whereas an exemption is simply a signature on a piece of paper by a farmer or

rancher that they are a registered producer and then away we go. There are no administrative costs beyond that.

Getting that money back into producers' hands in a timely fashion is what's necessary, along with not costing the government a lot of money to administer the program as well. That's why we are fully on board with Bill C-234 for the exemption, as opposed to the rebate system.

Mr. John Barlow: Thanks, Mr. Currie.

Certainly, we have seen the high cost of diesel, propane and fertilizer, and now there's discussion of there potentially being a shortage of some of these products as well as herbicides.

In the face of a global food shortage, which is certainly a very real possibility with the conflict in Ukraine and now the federal government talking about a 30% reduction in fertilizer use, what impacts, Mr. Currie, would that have on the ability of farmers to meet not only local demand but perhaps an increasing global demand when it comes to reduced yields?

Mr. Keith Currie: Farming is what we do very well in this country. We're very efficient at it, and we're good at what we do. We take pride in not only feeding our own country but feeding people around the world, so having a reduction in fertilizer because of cost or because of an action requiring a reduction—and we prefer to talk about a reduction in emissions as opposed to a reduction in fertilizer—certainly....

There's a limit to what we can really cut back on until it greatly affects our yields. Once we start affecting yields, there's a spiral downward that we just cannot recover from economically. Quite frankly, we will not be able to be those people who feed the world if we reduce our fertilizer beyond certain levels.

We want to work with government on this.

The Chair: Thank you, Mr. Barlow.

Thank you, Mr. Currie.

[*Translation*]

I will now give the floor to Mr. Drouin for six minutes.

[*English*]

Mr. Francis Drouin (Glengarry—Prescott—Russell, Lib.): Thank you, Mr. Chair.

My first question will go to the Canadian Federation of Agriculture. I want to say thank you to Mr. Currie for attending Mr. Pommainville's wake yesterday. I know the community really appreciated it.

On the issue of Bill C-234, I know that on Bill C-206 there were some conventions with regard to putting a timeline on that exemption.

Are you in favour of putting a 10-year exemption on there or just a complete exemption for as long as it lasts?

• (1125)

Mr. Keith Currie: I think what we're looking for is to be a partner with government on how we can go forward in whatever way that looks.

If the status quo is going to remain, then that exemption would probably last in perpetuity, but we want to be that partner with all governments going forward on how we can be the people who can help practically implement programs on the ground that are going to get us to where we need to be on the climate change file.

To say it will only be for 10 years would be a guess as to where we're sitting as far as programming goes. We want to do our part—let's be clear about that—but it cannot be on the financial backs of farmers or ranchers across the country for the benefit of all society.

Let's get the exemption in place, and then we can make amendments to it as we go forward and see how the program's working.

Mr. Francis Drouin: Okay.

To the Agriculture Carbon Alliance, Mr. Ross, you have mentioned that the technology is not necessarily yet available. I know this because I made my own announcement with regard to BioDryAir grain dryers. The farmer last year spent \$200,000 in propane; today he's spending \$40,000 in wood pellets, so that's a saving of \$160,000 of his own costs. Needless to say, he's not paying the carbon tax on that.

Is it because that sort of technology is yet not viable for all of Canada or, in your opinion, is it just that there is no technology with regard to grain drying?

Mr. Scott Ross: Dave and I were speaking about this earlier this morning. I will defer to him on some of the specifics around the grains and oilseed sector, given that he works a little more acutely there.

I think what we hear is that it's not a technology that works for everyone across the country. There are scalability issues with the size of operation at some of the larger farms in western Canada, for example. There are labour costs associated with access to biomass supplies that raised some issues there.

I'm certainly not saying that there are not now or never will be viable alternatives, but we certainly want to ensure, if we are going to be exploring those viable alternatives, that in the interim farmers aren't being penalized for technologies that aren't yet commercially viable for their operations.

Dave, do you want to expand on that a little?

Mr. Dave Carey: Just briefly to your point, Mr. Drouin, I think that is a progression in the technology, being able to use pelletization of wood. There is a carbon intensity that comes with that, too.

Previously, most biodigesters required farmers to take additional passes on their fields, take up that stubble and take up that extra

material after harvest, which requires more passes burning gas or diesel. Then it requires, if that is not dry, to somehow be dried out. Then it also requires storage, which can lead to a fire hazard plus having the space.

We have heard qualitatively that to manage a biodigester might require hiring an additional hand, which again impacts your profitability and, again, could have a reverse effect if wood pelletization is scalable to get the necessary BTUs if you're doing more passes on the field with your tractor.

To your point, I think that speaks to an evolution of the technology, and that's why we want to see that continuum. The sustainability continuum is something we're very supportive of at ACA.

Mr. Francis Drouin: Thank you, Mr. Carey.

[*Translation*]

I am now addressing my francophone friends from the UPA.

You said that you have used the on-farm climate action fund. You talked about cover crops. I just want to make sure I understand what the situation in Quebec is.

Have the majority of farmers adopted cover crops or is that what you want to do with the program's funding?

Mr. Daniel Bernier: I assume you are speaking to me.

Mr. Francis Drouin: I am speaking to you or to Mr. Caron.

Mr. Daniel Bernier: That practice is becoming popular. More and more producers are choosing those solutions. However, we are seeing that this is a challenge for some farm producers, since costs are associated with those practices after all. The benefit derived from them, in terms of improving soil health, is of a long-term nature. Support for a transition period is needed because it is not really easy for everyone to master the technique. It depends on the type of soil and the region people are based in. The technique must first be mastered. That is why coaching is needed, but costs are associated with that.

That is why we think rewards for environmental goods and services are an appropriate formula, which can facilitate the adoption of those practices.

• (1130)

Mr. Francis Drouin: Do you think the cost of transition is a major obstacle to the farming community's adoption of that practice on a larger scale?

Mr. Daniel Bernier: Yes, definitely. For quick gains, we need that assistance. Otherwise, it will be done over the longer term.

The Chair: Thank you, Mr. Drouin and Mr. Bernier.

Mr. Perron, go ahead for six minutes.

Mr. Yves Perron (Berthier—Maskinongé, BQ): Thank you, Mr. Chair.

I thank all the witnesses for joining us today.

I will continue along the same lines, Mr. Bernier.

You talked about rewards for environmental goods and services. The UPA is calling for an agri-environmental program to be created.

Could you elaborate on how that program could work?

Mr. Daniel Bernier: Those would be amounts proposed to producers to help with the extra costs related to some of the best practices. We think that, to advance those practices, we will need a reward system for pro-environmental actions that are not profitable. We feel that, if producers must always carry that burden and thereby jeopardize their profitability, we won't be able to move forward as quickly as we would like.

The carbon market could be worthwhile, but significant costs are still associated with that approach. In many cases, small farms have less access to those systems. So we think that rewards are part of the right formula.

Mr. Yves Perron: I would like to know what you think about my idea that we must make sure that the reward system is decentralized. In other words, producers' efforts must be recognized and they must be enabled, as business owners, to use that money in order to want to make new investments in their business.

Is that how you see this or do you have a different view?

Mr. Daniel Bernier: This must be adapted as locally as possible, since environmental issues vary greatly from one region to another. We are seeing this phenomenon within the same province. For example, issues are not the same for the St. Lawrence Lowlands and for outlying regions. Therefore, the process must be decentralized and adapted to producers' realities.

Mr. Yves Perron: If I understand correctly, the support is based on the principle of collective choice that is collectively assumed. You cannot carry the entire burden, but you are fully prepared to take action.

Mr. Daniel Bernier: That's right. As you know, in the agri-food industry, producers don't really have an opportunity to transfer to consumers increases in production costs. These societal demands are essentially meant to protect the environment, and we agree that this is necessary, but it leads to costs for businesses that should be shared among us.

Mr. Yves Perron: To implement such a system, we must have a starting point. Do you think the efforts some producers are already making could be recognized?

As in all industries, there are trailblazers. An easy example comes to mind, that of producers involved in organic farming.

What do you think about that?

Mr. Daniel Bernier: Ideally, past actions should be recognized, to a point. Trailblazing producers, who innovate on their farms and take risks, have had to bear costs. It is thanks to them the entire industry can benefit from the knowledge gained. So we think it would be necessary to recognize those producers' past actions.

Mr. Yves Perron: In that sense, don't you think it is ironic for a producer who has been selling organic products for 20 years or 25 years to have to pay to be recognized as an organic producer? Should they not instead be paid to be rewarded for selling organic products?

I would like to hear your thoughts on this.

• (1135)

Mr. Daniel Bernier: You are referring to the cost of certification.

In a way, producers agree to bear the costs of that certification. Generally speaking, those organic certified products have a value added. The issue is the cost of revising the standard. We think that is the federal government's responsibility. That standard is issued under the government's authority. Revision costs should be paid by the government. We currently know that there are issues. The government would like to pass the cost on to organic producers. I think that is very problematic.

Mr. Yves Perron: We heard from the minister a little while ago. My understanding of her answer was that the money was made available temporarily. It was not a matter of money withdrawn, but the end of something.

What do you think about that? Should that money be permanently available?

Mr. Daniel Bernier: Yes, indeed. That money should be permanently available.

Mr. Yves Perron: It is the government's responsibility. That standard enables producers to justify the value of their products and to promote their exports, if I understand the matter correctly.

Mr. Daniel Bernier: Exactly.

A national standard, which is there to guarantee the quality of the label, is a government responsibility.

Mr. Yves Perron: Have you held discussions with the government on this? Were you told this money would be withdrawn regardless of what happens? Is there a time frame?

I feel like we are not hearing a lot about it, which is surprising.

Mr. Daniel Bernier: We have made our representations. We maintain that it is the federal government's responsibility. The funding is in the amount of \$1 million every five years. The issue is knowing how producers could manage to fund that. We think that the federal government must handle it.

Mr. Yves Perron: Thank you very much.

The Chair: Thank you very much, Mr. Perron and Mr. Bernier.

I now give the floor to Mr. MacGregor.

[English]

Mr. Alistair MacGregor (Cowichan—Malahat—Langford, NDP): Thank you very much, Mr. Chair.

I'm going to start my questioning with the Agriculture Carbon Alliance.

Mr. Carey, in your opening statement, there was one sentence that stuck out for me. You said that you wanted to have a formal working arrangement between ECCC and AAFC.

I was looking abroad to other jurisdictions. In Australia—I'm going to paraphrase from their national soil strategy—they say that there's "a 20-year strategy that sets out how Australia will value, manage and improve its soil". Also, it "has been developed in collaboration with state and territory governments, the National Soils Advocate and other major stakeholders in soil science and land management".

The aims are to restore and protect soil nationally. They want it to be driven by "collaborative and coordinated on-ground action, research, education, monitoring and governance". They say, "All levels of government, industry, research institutions, private soil science practitioners and land managers have a role to play...".

What are your thoughts when you hear that a foreign government like Australia is embarking on such a strategy? Do you see any parallels for Canada and any lessons that we can learn from Australia as an example?

Mr. Dave Carey: Thanks for the question. I'll see if Scott has anything to add at the end.

A big driving force behind the ACA coming to fruition was that, after December 2020, "A Healthy Environment and a Healthy Economy" had around 65 bullet points, many of which had an agri-environmental focus. Shortly thereafter, there was a big webinar with ECCC around nature-based climate solutions. There were hundreds of people on the line and perhaps two or three agriculture stakeholders.

We like to be permissive rather than prescriptive, but the current venues—working group-wise or round table-wise—do not work. We need to be able to engage in a pragmatic, proactive and collaborative way further upstream. When I hear about that level of collaboration.... That's exactly what we want. We need a way to work directly with Agriculture and Agri-Food Canada and Environment and Climate Change Canada—with those who have sufficient seniority within both of those departments—and to have the right farm groups and producer groups around the table, to ensure that the policies rolling out are applicable. We often get into this cubicle or regulatory mind-making in Ottawa or Gatineau—and I'm part of that—but it's not applicable to the 20 million canola acres, or to the beef farms and dairy farms across Canada.

We need some way to engage meaningfully at a "small p" policy level. We're not there to talk political realities, but we are there to talk about how the government's goals can align with the farmers',

and how pragmatic policy can actually be achieved. I think that's something we do not currently have.

We defer to the government on how they want to implement that. There has been discussion about a joint role between Ag Canada and ECCC. The Canadian Food Inspection Agency and Ag Canada have a joint position. I'll pause there and see if Scott has anything else to add, Mr. MacGregor, but it's great to see that. That's how we're going to accomplish our goals.

• (1140)

Mr. Alistair MacGregor: Thank you.

With respect, Mr. Ross, I want to move on to Mr. Currie from the Canadian Federation of Agriculture.

On the same question, do you have any thoughts? Also, a supplemental.... You made reference to the living labs and so on. In the CFA's interactions with research institutions across Canada—notably the deans council of agriculture—and in addition to answering my previous question, can you also expand a bit more on where the knowledge gaps exist in measuring soil carbon content, etc.? Do you see any specific areas where you want to see federal research focus? I'd like your perspective, please.

Mr. Keith Currie: Thanks, Mr. MacGregor.

I think Mr. Carey outlined your first question very well. At the end of the day, what we're looking for is that practical applicability on the ground. We look at what governments have set as targets for the last 25 years with respect to climate change. Most have not even come close to meeting them, because they're not looking at what is practical to implement on the ground.

That's what we're asking for: Work with us so we can develop those programs together, and so we can actually move the bar going forward, without putting that burden back on the farm community, from a financial aspect.

When it comes to looking at research going on across Canada or what's needed.... At the end of the day, I think the big piece of the puzzle we're missing is data. Where are we starting from? It's very difficult to know where you're going if you don't know where you're starting from. That's a big piece we need to find out. How are we measuring soil carbon? Are we accurate? How are we going forward to find out which technologies out there can we further implement to improve carbon sequestration? We really need research on how to get and utilize that data to the best of our ability going forward.

Mr. Alistair MacGregor: Thank you.

Mr. Carey, in the last 30 seconds, do you have anything to add on where knowledge gaps might exist and where you think Canadian research can be best focused?

Mr. Keith Currie: Certainly, we're continuing to work on a soil strategy—

Mr. Alistair MacGregor: I was asking if Mr. Carey from the ACA could add to that. I'm sorry about that.

Mr. Dave Carey: I think he's right. We don't know exactly where the baseline is—the measurement—so, if anything, we need to take a step back. Some of the soil health testing methods we're using are almost a century old. Again, are we looking at carbon saturation, or how much soil can be pulled in?

I know the current measurements only look at root depth for crops that go to a certain point, whereas a crop like canola goes deeper. There are some fundamental basics, Mr. MacGregor, that we don't know yet, which makes it very difficult to determine, as we get into more nascent sciences, and possibly to measure indirect emissions, for example.

The Chair: Thank you, Mr. Carey.

Thank you, Mr. MacGregor.

[*Translation*]

Mr. Lehoux, go ahead for five minutes please.

Mr. Richard Lehoux (Beauce, CPC): Thank you, Mr. Chair.

My first question will be for Mr. Currie, from the Canadian Federation of Agriculture.

Mr. Currie, you talked about livestock in-feed additives. Health Canada considers those products drugs, but that is not the case in the European Union, Brazil and other countries you mentioned.

I would like you to elaborate on the issue of considering those products drugs rather than food.

[*English*]

Mr. Keith Currie: Thank you.

I'll ask my colleague Frank Annau to step in here on that question.

Mr. Frank Annau (Director, Environment and Science Policy, Canadian Federation of Agriculture): Thank you so much for the great question.

That was definitely [*Technical difficulty—Editor*] in regard to the 3-NOP cattle feed.

With respect to the actual difference in the approval process through Health Canada for it being considered a medication versus a cattle feed, our understanding is that the process does require a longer evaluation and more steps to go through in order for it to reach markets.

With respect to how that lines up with criteria for evaluating that difference in the EU, I think a little work has to possibly be done to look into why the EU may consider that classification to be quicker, more specific to cattle feed and more rapid in coming to market.

We do know, according to the Alberta study, that with different mixtures of cattle feed—whether it was mixed with corn feed or barley feed—you can get upwards of an 80% reduction in methane per cow, with usually a minimum of 30% reduction. That's obvious-

ly a very significant impact, especially with the increased recognition that methane has gotten over the last year under the IPCC reports.

● (1145)

[*Translation*]

Mr. Richard Lehoux: Thank you.

Do you have a recommendation for us from the Canadian Federation of Agriculture on this matter?

What kind of pressure should we be exercising to speed things up?

Many countries consider it a food, not a drug, which changes a lot of things for producers.

Could you provide a recommendation on this?

Who should we talk to first to speed up this process?

[*English*]

Mr. Frank Annau: My immediate reaction would be to look in to the EU, specifically under their farm to fork strategy, at what evaluation process they may be using in order to make sure that this feed gets to market as quickly as possible.

Whether it can be considered more of a feed approach as opposed to a veterinary drug here in Canada would be a really great place to start, as well as making sure that cattle feed from other potential approaches are evaluated here as well. There's news, for example, about red seaweed cattle feed additives that may have a reduction per cow.

[*Translation*]

Mr. Richard Lehoux: Thank you very much, Mr. Annau.

I'm going to put a question to Mr. Bernier from the Union des producteurs agricoles.

With regard to the need to fund research more adequately, particularly applied research, what progress has been made on that front?

Do you have any solutions to propose to accelerate the funding of applied research?

Mr. Daniel Bernier: It certainly takes more research, whether it's finding alternatives to pesticides or techniques to reduce greenhouse gases. Food was also alluded to. We need to invest in knowledge. That is how we can move our agriculture forward. We must invest more in research and not forget the transfer of this knowledge to agricultural producers.

Mr. Richard Lehoux: Exactly. My question was along those lines. It's important to do research, but if we want to stay competitive, it also has to be applicable afterwards, in a simpler way, in the agricultural field.

I would like to hear your views on this.

Mr. Daniel Bernier: One solution we advocate is to partner researchers with producers to bring science as close as possible to the needs of agricultural producers.

At our living lab at Lake St. Pierre, we have just this approach, and it is very much appreciated by agricultural producers. We do research specific to the needs expressed by agricultural producers.

Mr. Richard Lehoux: Thank you, Mr. Bernier.

Thank you, Mr. Chair.

The Chair: Thank you both very much.

Ms. Taylor Roy, you have the floor for five minutes.

[*English*]

Ms. Leah Taylor Roy (Aurora—Oak Ridges—Richmond Hill, Lib.): Thank you so much.

Thank you to all the witnesses. This has been incredibly informative. It obviously points out the need for a lot more research in this area.

My first question was to do with the statement made by Mr. Bernier—and perhaps Mr. Caron, since you haven't spoken to address this—that the greenhouse gas emissions from the agricultural sector are necessary and are likely not to be reduced.

In terms of net zero, with some of these other things you've been talking about, like the carbon sequestration in soil, can you see the sector getting to net zero, as opposed to eliminating all greenhouse gas emissions?

[*Translation*]

Mr. Daniel Bernier: In fact, carbon sequestration can certainly help the agricultural sector to reduce its carbon footprint, but I would be surprised if carbon neutrality is achieved. Also, I wonder about this: when you want to sell these reductions on the carbon market, it means that it is other sectors, particularly the industrial sector, that could appropriate this reduction. So, at some point, we will have to clarify what we want. Do we want agriculture to reduce its carbon footprint or do we want to use agriculture as a producer of carbon credits for industry?

Both are possible, but if we hope to reduce the carbon footprint of our agriculture, we should be careful. If we sell our reductions to other sectors, we can't count them twice. Either they belong to us or they belong to the industry or potential buyers.

● (1150)

[*English*]

Ms. Leah Taylor Roy: Yes, I understand that. However, having said that, do you think it would be possible to get to net zero if you were retaining those carbon reductions within the agricultural sector? Could you see getting that 8% down to zero?

[*Translation*]

Mr. Daniel Bernier: I doubt it. We can certainly reduce our emissions by 10%, 15% or 20%, or even more, but to get them to zero, that would surprise me.

Note that I only have the Quebec picture. It is possible that the carbon sequestration capacity is greater in western Canada. We

must be aware that agricultural soils do not have an infinite capacity to sequester carbon. It takes soils that are relatively poor in organic matter and for which a change in practices can contribute to increasing the organic matter, and therefore the carbon in the soil. This can then be done for a few decades, but there will come a time when the soil will be saturated with organic matter and will stop sequestering carbon.

In Quebec, we have some sequestration capacity, but it is not enough to bring the carbon footprint to zero.

[*English*]

Ms. Leah Taylor Roy: Okay. Thank you.

My other question is for the Agriculture Carbon Alliance. There are two parts to it.

One is about the price on pollution—the carbon charge—and the rebate that's being given right now. You mentioned that having this rebate at the end of the year, and the time lag, were reducing investments being made by the agricultural sector. Would a move to providing those rebates perhaps four times a year, as opposed to through a credit on the tax system, improve that?

The second part of that question is what investments you feel are not being made. Are those investments that would otherwise be reducing carbon emissions or greenhouse gas emissions?

Mr. Scott Ross: I could speak a bit to it, and I'll let Dave speak to the time lag, because that's something he's a little more familiar with.

In terms of the types of investments we're looking at, it really ranges, depending on the type of farm we're speaking about. There are significant investments that are possible in terms of a barn perspective. There's LED lighting, heat exchanges and anaerobic digesters. There is a whole host of these sorts of investments that can be made, but the concern is ensuring that sufficient capital is available.

I think a more expedient return of funds from the rebate would be beneficial. From my perspective, there is still a concern with the extent to which the carbon price that an individual farm is paying is reflected in the rebate they're receiving. There are some equity considerations there.

Ms. Leah Taylor Roy: I have one more question to do with the grain drying and the use of propane and other fuels.

I read about the electrification of the system in Manitoba and perhaps using heat pumps, as well, to help with this. Is that at all feasible, and has anything been done on that?

The Chair: Could we have your answer in 15 seconds, please?

Mr. Dave Carey: Manitoba, Ontario and Quebec have hydro electrification. In Saskatchewan and Alberta, it is not possible. The grid does not allow it, or it's not hydro-based; it's actually coal-based in some regards. Unfortunately, the answer is no.

[*Translation*]

The Chair: Mr. Perron, you have the floor for two and a half minutes.

Mr. Yves Perron: Thank you very much.

Mr. Bernier, I would like to come back to one of the things we discussed earlier, which is the need for decentralization. We hear a lot of talk. Producers fear, among other things, as you just mentioned, that the agricultural sector will provide carbon credits to other, more polluting sectors. They are also afraid that there will be a lot of bureaucracy or standardized programs, which would mean that producers would have to work many hours to fill out forms, to tick the right box to get something. Wouldn't decentralization, as mentioned earlier, be better for them?

Very quickly, could you respond to that?

• (1155)

Mr. Daniel Bernier: Obviously, we need to minimize the administrative burden. This is perhaps one of the drawbacks of the carbon market, because there are many reporting requirements and audits that need to be done. It's not insurmountable, but it is an example of red tape.

Cumbersome bureaucracy is a problem for farmers. We need to try to simplify the process and change the programs so that they can respond to local needs. We think that compensation is a good solution.

Mr. Yves Perron: This money must also be made available to producers when their farms are ready to make investments. Is that right?

Mr. Daniel Bernier: Precisely.

Mr. Yves Perron: Thank you very much.

I would like to hear from Mr. Currie about the organic standard, which we discussed earlier with Mr. Bernier.

Mr. Bernier was telling us that the fact that the revision of this standard was not federally funded was complete nonsense. I imagine you feel the same way.

[*English*]

Mr. Keith Currie: I'm sorry, but could I get you to clarify that question?

[*Translation*]

Mr. Yves Perron: Yes, of course.

The federal government has announced the end of funding for the organic standard review. We discussed this earlier with Mr. Bernier and he told us that this was complete nonsense, because the responsibility for funding the revision of the standard fell to the federal government. It's a Canada-wide standard that allows for export, among other things.

I'd like to hear your thoughts on that.

[*English*]

The Chair: You have 30 seconds, Mr. Currie.

Mr. Keith Currie: As representatives of all farmers right across this country, we don't prioritize one production standard over another.

Certainly organic production is something we are very proud of in this country. I think it should be funded to the fullest where it needs to be, as should all other types of production, especially when it comes to the aspect of green energy or when we're talking about carbon sinks and all things related to climate change.

The Chair: Thank you, Mr. Currie.

We're going to have to leave it there. My apologies.

Thank you, Mr. Perron.

Right now we have Mr. MacGregor to finish us off, for two and a half minutes.

It's over to you.

Mr. Alistair MacGregor: Thank you very much, Mr. Chair.

Monsieur Bernier, I'll start with you.

I was listening with interest when, in your opening statement, you were talking about the effects of compaction. Through my wife's learning, I've been learning a lot about that and about the anaerobic conditions that result from it, what it does to soil ecology and how it gets rid of all the preferential micro-organisms that you want. For this committee's purposes, could you elaborate a little bit more on what happens to soil ecology when compaction happens and what that, then, forces a farmer to do to rectify the situation?

You mentioned the fact that you bought two tractors with a lighter footprint in the place of one heavier one so that you could reduce the effects of compaction. Perhaps you could expand a little bit more on that. I think you talked about the stress in terms of the availability of capital to allow for that. If you could expand on those subjects, it would be very helpful for our committee.

Thank you.

[*Translation*]

Mr. Daniel Bernier: Certainly.

Soil compaction is indeed a significant problem, particularly in Quebec and eastern Canada. In fact, this problem exists wherever the soils are rather clayey and the climate is rather humid. When these two elements are present, the risks of compaction are significant.

The first thing to do is to act preventively by not driving over the soil with heavy machinery. The axle load is very important and you should not exceed the recommended limits. As I mentioned, unfortunately, the size of the machinery used today is constantly increasing to meet the needs of producers to do their work. The weight of the machinery is a real problem.

Soil compaction destructures soils. Because there is less water infiltration, soils are more vulnerable to periods of drought and the root network has more difficulty in spreading throughout the soil to supply itself with mineral elements and hydration. Once the structure is compacted, there is less air circulation in the system and this has a negative impact on biological activity and microbial life. This is a major degradation phenomenon and the whole system starts to function less well.

• (1200)

The Chair: Thank you, Mr. Bernier and Mr. MacGregor.

[English]

That ends panel number one. Thank you to our witnesses for your appearance today. Speaking on behalf of the whole committee, thank you for your work in agriculture, and for your testimony today.

Colleagues, we're going to take a three-minute break, and then we're going to go to the second panel.

Thank you, everyone.

• (1200)

(Pause)

• (1205)

The Chair: [Technical difficulty—Editor]

Dr. Justine Taylor (Director, Stewardship and Sustainability, CropLife Canada): [Technical difficulty—Editor] and science-based so we can continue to advance agricultural sustainability. Regulatory oversight for agriculture is interwoven among many departments, and a whole-of-government approach must be embraced and realized.

Two, incentivize and reward efforts by Canadian farmers. Canadian farmers are world leaders in the adoption of technologies that enable the sequestration of carbon. However, at present those efforts are not being recognized by government policy.

Three, promote and defend Canadian sustainability. We would like to see the Government of Canada promote the sustainability success story of Canadian farmers on the world stage and ensure that it is recognized in all international forums and negotiations.

Four, support exports. We ask the government to better use international mechanisms and institutions to ensure science-based, predictable and transparent trade rules for agriculture. We are currently at risk of non-science-based decisions in export markets impacting the adoption of innovation in Canada and jeopardizing our progress on sustainability.

[Pursuant to a motion adopted by the committee on March 31, 2022, the speaking notes of Dr. Justine Taylor have been appended to the Evidence for this meeting. See appendix—Remarks by Dr. Justine Taylor]

• (1210)

The Chair: Thank you, Dr. Taylor.

We're now going to move to Mr. Graham, for five minutes.

Mr. Graham.

Mr. Clyde Graham (Executive Vice-President, Fertilizer Canada): Good morning, everyone. I just want to note that Tom Bruulsema is an eminent soil scientist and if you have any more technically oriented questions regarding nitrous oxide or soil health, I would invite you to ask Tom.

Fertilizer is an economic driver, contributing \$24 billion annually and employing over 76,000 workers in the Canadian economy. We export to over 75 countries, contributing to agricultural economy

industries around the globe. We help feed the world. In fact, without fertilizer, on a global basis, food production would be cut in half. Our 4R nutrient stewardship program helps farmers increase their sustainable productivity, demonstrating that there is a solution that supports both the economy and the environment.

For those who are unfamiliar with it, the 4R nutrient stewardship program emphasizes applying the right source of fertilizer at the right rate at the right time and in the right place. This allows farmers to optimize their fertilizer use to sustain yields while minimizing loss of nutrients to the environment. In particular, today we're talking about nitrous oxide, so 4R does significantly reduce the conversion of nitrogen fertilizer in the soil to nitrous oxide, which is an important greenhouse gas.

4R nutrient stewardship balances farmer, industry and government roles to improve on-farm economics, crop productivity and fertilizer efficiency while benefiting the environment. This isn't new for Fertilizer Canada. We have been working with partners in industry, academia and government, and educating, promoting and helping farmers implement the 4R program for over 15 years. As of 2022, over six million acres have been verified under 4R management in Canada with millions more acres following best management practices. I would note too that the canola industry and the Government of Saskatchewan have both set very ambitious goals for increasing adoption of 4R nutrient stewardship in their areas.

Today, 4R nutrient stewardship is globally recognized and translated into many languages and is as applicable to a large western Canadian farm as it is to a West African smallholder operation.

The world's population is estimated to grow by approximately two billion people by 2050. Global agricultural production will need to increase by 50% from 2005 to feed all these new people. Geopolitical turmoil around the world, most recently with the war in Ukraine, adds to the strain on our food supply. Fertilizer plays an important role in providing food security around the world and providing Canadians with affordable, nutritious food. Farmers rely on nitrogen-based fertilizers to increase the amount of food they grow, putting food on dinner tables across Canada and beyond.

Overall, fertilizer consumption in Canada has increased over the past two decades as farmers have utilized fertilizer to increase their yields in Canada. These higher yields have been obtained while maintaining high levels of nutrient use efficiency. Higher yields are necessary to meet the growing global demand for Canadian crops, which is endorsed by the federal government's target of \$75 billion in agri-food exports by 2025.

Canada has also set ambitious fertilizer emission reduction targets for nitrous oxide for 2030 and to meet these targets, we believe that 4R nutrient stewardship is essential. We were very pleased to see formal recognition by Agriculture and Agri-Food Canada of 4R nutrient stewardship as an innovative solution to support greenhouse gas reductions and enhance food production in the discussion paper on its emissions reduction initiative released in March.

This is an urgent matter. There are only eight growing seasons left until the 2030 harvest is complete. We must work together to accelerate uptake in the program among Canadian farmers. Reaching this 30% target requires the government to work closely and urgently with the agricultural community to increase the use of 4Rs. With 4R nutrient stewardship at the centre of the federal fertilizer emissions reduction strategy, farmers can continue to grow more food, increase exports, raise farm incomes and improve food security at home and abroad.

I wanted to note that we are also very pleased by the broad consultation process the government has announced because really, although this issue is often associated with the fertilizer industry, it is really about farmers and their livelihoods.

• (1215)

There are a few specific recommendations we'd like to make to support—

The Chair: Mr. Graham, I apologize. I gave you few seconds past five minutes, but I know that you will have the chance to reiterate those recommendations when the questions come up.

[*Translation*]

We'll now continue with Mr. Nault.

Mr. Nault, you have the floor for five minutes.

Mr. Jacques Nault (Vice-President, Agronomy, Logiag Inc.): Thank you, Mr. Chair.

Thank you for inviting me.

It is important that I tell you who I am, about the company I represent and what we do.

I am the founder, owner and vice-president, Agronomy, of Logiag, which has been providing agri-environmental services since 1999. We develop our own technologies, our own software. About 6,000 farmers are now using our agri-environmental services. Most of them are in Quebec, but there are 500 or 600 farmers in the Maritimes and another 150 or 200 in the United States.

My presentation is different from the ones I heard this morning. We are practitioners of climate transition. We started looking at it in 2019. We developed laser technology to do soil testing and we won the Indigo Carbon Challenge from Indigo Ag in 2021, which was last year. We have demonstrated our ability to measure the organic carbon or organic carbon stocks that are in soils. In addition, we have started to set up a climate transition support service.

I'd like to describe it to you in the following way.

We work with farmers, for whom we make the reference scenario, that is, the current emissions and carbon stocks that are currently in their soil. We guide them and present them with climate

transition scenarios, such as adopting certain practices and transforming their business to decrease emissions and increase carbon stocks.

At the other extreme, the tonnes of carbon generated by farmers need to be valued by a potential buyer. So I've been looking at agri-food processors. I believe that the carbon reductions from the farm should stay within the agri-food system. We have one of the largest food processors in North America right now that is interested in the reduction that our farmers are making. They're looking at it with the goal of using it to offset their entire agri-food chain.

In between, we have developed an accounting methodology and a carbon accounting system that facilitates data collection, calculations made from scientific models, and tracking changes in soil carbon emissions and stocks.

Let me give you a very concrete example, as I only have two minutes left. On a typical dairy farm, half of the emissions come from the animals, while the other half comes from the fields.

In the field, there are two main sources of emissions: nitrogen and the use of fossil fuels for tillage—propane used to dry grain, for example. In the barn, there is methane, which is generated from the digestion of fibre by animals.

On the field side, to reduce emissions and increase carbon, you need to increase the stocks of organic matter in the soil. This is the crux of the matter; a 1% increase in organic carbon over 30 centimetres will remove 150 tonnes of CO₂ from the atmosphere.

On the animal side, it essentially boils down to promoting their health and increasing their longevity, which almost automatically translates into lower greenhouse gas emissions.

This concludes my presentation.

• (1220)

The Chair: Thank you, Mr. Nault.

We will now have our question period.

Mr. Epp, you have the floor for six minutes.

[*English*]

Mr. Dave Epp (Chatham-Kent—Leamington, CPC): Thank you, Mr. Chair, and thank you to the witnesses for your excellent testimony.

I'd like to begin with Fertilizer Canada. The 30% target in greenhouse gas emissions from fertilizer applications mirrors a similar target announced by the EU. Can you comment a bit about the science around the base that we're starting from? Can we assume that here in Canada we're starting from the same base that the EU is basing their targets on?

Mr. Clyde Graham: Okay, and maybe Tom Bruulsema can help me out.

I think the difference is that the EU program is focused on reducing fertilizer use, whereas it's now clear that the federal government here in Canada is focused on reducing nitrous oxide emissions when you apply nitrogen fertilizer.

I would say that European agriculture is quite different from North American agriculture. We tend to be more efficient in our production. There probably is more room to reduce fertilizer use in Europe without affecting yields, whereas I think our North American farmers are highly efficient in fertilizer use, and it is hard to see us reducing fertilizer use in North America without negatively impacting yields, particularly if we want to grow our agribusiness economy.

Mr. Dave Epp: Thank you.

I want to pick up on that point. One of the reports that's come out from the government is that fertilizer use has increased by 71% from 2005 to 2019. Can you comment on a couple of areas? Is that actual fertilizer application? Or is that fertilizer storage?

In that same report, it documents that the emissions have gone up by only 64%. I assume that alludes to an increased efficiency. Can you comment on that, please?

Let me add one more thought. My other understanding is that there's also been a massive change in crop mix, which is feeding that.

Mr. Clyde Graham: I'll make a couple of quick comments.

One is that farmers are growing higher-yielding varieties of crops that require more intense fertilization. Canola, for example, is a good example of a very profitable crop for farmers. It's very important food and animal source of nutrition, but it does require a lot of fertilizer.

I'll leave it at that.

Tom, did you have anything you wanted to add?

Dr. Thomas Bruulsema (Chief Scientist, Plant Nutrition Canada, Fertilizer Canada): I think it's important to recognize that the increase in fertilizer use has been commensurate with the increase in crop production, particularly on the Prairies, and in that shift in production, canola now comprises a greater proportion of Canada's crop production.

Also, the total production from the Prairies has increased more than it has in eastern Canada. The nitrous oxide emission coefficient currently used in the national inventory is lower in the Prairies than it is in eastern Canada and, for this reason, nitrous oxide emissions aren't shown to have increased as much as the nitrogen fertilizer use.

Mr. Dave Epp: Thank you.

That all ties in with the current situation the world is facing with Russia's invasion of Ukraine. Can you comment on whether a lens on food security should also be applied to any kinds of conditions that we're looking at imposing on the ag sector as it relates to food security and to feeding our Canadian population and—just as important now—other parts of the world, given the strain on food sourcing from another breadbasket?

Mr. Clyde Graham: Certainly, the situation in Ukraine is a stark reminder of some of the realities of the world we live in and of how food security should never be taken for granted by anyone. Obviously, the loss of grain production in the marketplace because of the war and the sanctions is a critical issue that needs to be addressed.

Fertilizer Canada is a hundred per cent behind the goals of the government to reduce greenhouse gas emissions and mitigate climate change, but at the same time, I think there has to be some balancing of the other sustainable development goals that have been set by the United Nations, including a reduction of poverty—

• (1225)

Mr. Dave Epp: Thank you, sir. I do want to get two more questions in.

Very quickly, can you comment on any clarity from Global Affairs on the 35% tariff on fertilizer in motion prior to March 2?

Mr. Clyde Graham: I don't really have any comment except to say that it applies to all goods coming into Canada.

Mr. Dave Epp: Thank you.

I'd like to get one question to CropLife Canada.

Dr. Taylor, it's good to see you again. Our circles again overlap.

The Canadian government recently announced \$50 million to go towards the PMRA and the PMC. It's great news to see that money is going toward our system. I appreciated your comments about innovation being a driver to balance our environmental goals and our production goals.

Can you comment on the new layer of oversight? Will that help this process that's being contemplated? Will that bring balance to speeding innovation when it comes to registering our crop protection products?

Mr. Ian Affleck (Vice-President, Biotechnology, CropLife Canada): I can take that question. Thank you very much.

As you mentioned, it's great to see an investment in the regulatory structures that enable innovation in Canada, like the PMRA. However, there is concern about how that money is used and how it's invested in the system—whether it's used to make sure we're having timely delivery of innovations to farmers or whether it becomes focused on other elements that are not as directed by science or focused on the delivery of that department's mandate.

There has been quite an overlay of structure there that is focused on transparency and transformation. We have a world-class pesticide regulatory framework. It doesn't require extensive overhaul. It doesn't mean it doesn't require thoughtful review, but as this new transition and transformation agenda moves forward for the PMRA, it is something we are watching very closely and hoping that the money does not get completely used in oversight versus delivery of programs.

The Chair: Thank you, Mr. Affleck.

Thank you, Mr. Epp. I gave you a few extra seconds there to get that across the finish line.

Mr. Louis, we'll go over to you for six minutes.

Mr. Tim Louis (Kitchener—Conestoga, Lib.): Thank you, Mr. Chair.

I want to thank all the witnesses for being here today and for this important testimony.

I'm going to start with Fertilizer Canada, so we'll finish where we left off.

Mr. Graham, you were about to give us your recommendations.

Mr. Clyde Graham: I'll try to keep them very short.

We are extremely pleased that AAFC and Environment Canada have both been very clear on recognizing the importance of 4R nutrient stewardship to climate change reduction ambitions. We feel that those departments now have to help put those words into action by fully integrating the 4Rs into their programs, policies and international climate diplomacy.

Further, we would recommend that Agriculture and Agri-Food Canada increase the focus of future investments on 4R nutrient stewardship. That goes beyond the current \$200 million on-farm climate action fund.

We shouldn't limit the tool box that is available to farmers for improving their nitrogen use efficiency and reducing nitrous oxide. We think AAFC needs to expand its future programs to fully explore a wide range of emerging technologies in the 4R tool box, such as enhanced efficiency fertilizers, variable rate application, biostimulants and biologicals, to name a few.

We are also underestimating the power of certified crop advisers, who are the most trusted advisers to farmers, to help farmers adjust to new management practices.

Also, protocols or offset programs need to be a higher priority for N₂O.

Lastly, as Tom mentioned, there are some issues with the national inventory. We think some work needs to be done to make the national inventory of greenhouse gas more reflective of the current reality on farming in Canada.

• (1230)

Mr. Tim Louis: Thank you.

Just last week I had a good discussion with a company in my riding of Kitchener—Conestoga. Alpine Plant Foods is a manufacturer

of seed-placed liquid fertilizers. They were talking about high-quality fertilizers that are put with seeds and sprayed on leaves.

We're talking about increasing investments. Would that include research as well?

What are some of the research ways we can help deliver this nutrition? How can we as a government support that research, working with academia, other levels of government and businesses?

Mr. Clyde Graham: I think that a lot of the products are coming into the marketplace. Nachurs Alpine is one of our member companies. A lot of members of CropLife are also branching out into the nutrient area to provide enhanced efficiency products. Companies are very good at innovating. Not all of the innovation is in Canada, but it is shared around the world.

Where the Government of Canada can offer some of the most important aspects are, as Ian was saying, in ensuring that the regulatory system is timely, effective and allows for innovative products to come into the market.

We also have a lot of work to do to identify exactly how much can be achieved from the use of these products in terms of reducing nitrous oxide. There needs to be an enhanced research program to evaluate not only new products, but other best management practices to reduce nitrous oxide.

Mr. Tim Louis: Thank you for that answer.

I would like to turn to CropLife Canada. Dr. Taylor, you mentioned the use of green space. My riding has the Mike Schout Wetlands Preserve. It's a 55-acre naturalization and wetlands restoration project.

You mentioned the importance of maintaining land in its natural state. Can you comment more on the biodiversity advantages, how it produces oxygen and how it sequesters carbon? Are there ways that we can incentivize and reward farmers for maintaining natural states on their farms?

Dr. Justine Taylor: I can begin, and then pass it over to Ian if he has any further comments.

First of all, we're not soil experts. I'll pass it over to Tom for any comments on that. What's important for us is that our tools allow for land to be more productive, which then allows for more land to be held in its natural state.

Obviously, those lands in their natural states have an increased ability to support biodiversity right from the soil level all the way up to the birds, insects, etc. There's also an enhanced ability to sequester carbon, as mentioned.

In terms of how we support farmers to be more conscious of those lands on their farms, this is really finding an effective way to assign value to those environmental and social goods that those lands provide.

It's not an easy question, for sure. I'm sure there are many people with more experience who could provide other solutions, but we need to be able to assign value to those lands, so that farmers are not only farming their field crops but also farming their natural spaces.

Ian, do you have anything to add to that?

Mr. Ian Affleck: I would only add one anecdote.

I grew up on a potato farm in Prince Edward Island. Recently, I was home and the UPEI was doing its scan of the province. Since the turn of the century, it has seen about 30% more forest in P.E.I. than there was earlier in the century. That is because of innovation, mechanization, fertilizer and better varieties, allowing farmers to leave their less productive land to create forests, and doing more with the land they're already farming.

It's putting more land back into green space, because all of these tools working together provide the most efficient agriculture.

The Chair: Thank you, Mr. Affleck, and Mr. Louis.

It was a great round of questioning.

[*Translation*]

Mr. Perron, you have the floor for six minutes.

Mr. Yves Perron: Thank you, Mr. Chair.

Mr. Nault, I really enjoyed your very practical presentation. Again today, we heard from many witnesses about the importance of financially rewarding positive environmental actions and ensuring that these funds are available to businesses.

I would like to hear your thoughts on that.

● (1235)

Mr. Jacques Nault: Thank you, Mr. Perron.

Certainly, the efforts that farmers must make to undertake and complete a climate transition pose a risk. It involves adopting and adapting a range of practices and investments in order to successfully reduce emissions and increase soil carbon levels. This means that farmers must spend money and make investments.

I believe that part of this risk should be mitigated in some way through direct compensation to farmers who make the transition. This compensation should take into account the farm's results in terms of reductions in emissions and increases in soil organic carbon stocks.

Mr. Yves Perron: I believe that you have answers that may be of interest to us in several areas, so please take the time to respond.

How do we measure this improvement and take into account the trail-blazers, who have been making efforts for a long time, such as organic producers?

Mr. Jacques Nault: Thank you for the question.

That's exactly what we're doing with the farmers. We took the time to develop a service. Now over 100 farmers in Quebec are buying this climate transition service, which includes three steps. The first step is to establish the reference scenario, or starting point. We developed a computer system in which we integrated equations from the Holos software and some other models to compensate for Holos' weaknesses.

We designed emissions calculation models. Some witnesses identified certain emissions, including nitrous oxide emissions. We perform these calculations. We then sample the soil down to 30 centimetres and assess the carbon stocks using the technology developed.

This reference scenario, or starting point, helps us determine the soil situation on the farm at the outset. We provide a transition plan, a series of practices that the farmer could adopt or adapt to improve the situation. I should say that none of this works unless a buyer at the other end acknowledges that this constitutes a real improvement.

One witness said earlier that it was difficult for small farms, and that it was complicated, expensive, and so on. Personally, I take exception to that. We've managed, as a small company, to develop a methodology. We're currently having it certified according to the ISO standard. This methodology is being recognized by major North American processors. Our computer system performs the carbon accounting, but we don't charge the farmers any extra for this service. We establish their starting point and we support them in their transition.

By generating reductions and already having a buyer ready to acknowledge them, the farmers making the improvements can fairly easily understand how they'll make gains. That isn't to say that the entire burden of this transition falls on them. I think that they should receive government support.

Regarding your other question, we've already seen success. Of the 100 farms that we've worked with, about five of them successfully made their climate transition. Their emissions are extremely low, no matter how you measure them, either in tons of CO₂ equivalent per hectare or in kilos of CO₂ per litre of milk. They've managed to increase organic matter levels to 2% to 3% above what we would normally expect to find, for example, in Montérégie-Est or Montérégie-Ouest.

It's relatively easy for us to see the difference, because we have a huge database of 6,000 clients. We have soil tests from 6,000 farms. We can see, on a regional level, organic matter averages. We can see that these five farms stand out. These five farms successfully made the climate transition. At this point, it's harder for them to keep improving because they're already very advanced. In some ways, a fairness and ethics issue arises. They started 20 years ago, without any incentives. They challenged the dominant model. They were able to integrate practices and achieve economic success in their transition.

We can compensate these farms in two ways. The first is to use a generic baseline for comparison purposes. Since these farms are already ahead, an equation would help compare their current performance with the generic performance of their region or industry. The second is—

● (1240)

The Chair: Sorry to interrupt, Mr. Nault.

Mr. Perron, your time is up.

However, you can continue this discussion in the second round of questions.

Mr. MacGregor, you have the floor for six minutes.

[*English*]

Mr. Alistair MacGregor: Thank you, Mr. Chair.

I'll start my question with Fertilizer Canada. A lot of the discussion that we've had has been about the 4R stewardship principles—and those have been great—and containing our NO₂ emissions on farm. I think if we're going to have a fulsome picture of the agricultural landscape in Canada, we also need to go a bit further upstream.

What I would like to know from you is this. When it comes to fertilizer production and the emissions associated with that, can you tell the committee a bit about what the trend lines have been like in terms of fertilizer production and the greenhouse gas emissions from that, or anything that would be useful in the context of this study for the committee to hear from you on that?

Mr. Clyde Graham: Our industry association represents manufacturers of nitrogen fertilizer across Alberta, through to all the provinces, through to Ontario, and then the significant potash mining activities in Saskatchewan.

Increasing the efficiency of our operations has been an important activity going back decades.

Our critical fuel for running the nitrogen manufacturing process and also for mining and processing potash as fertilizers is natural gas, a very clean fuel. Over the years our industry has tended to reduce its emissions intensity—so how much natural gas it takes to produce a tonne of nitrogen fertilizer or potash.

We've had a very positive working relationship with Environment and Climate Change Canada over the years. We've worked intensely with them on the limitations there are in reducing our emissions more aggressively, which are largely based on the chemistry of our processes and the available technology.

Certainly we are working to develop pathways to having greener production, but as I said, there are some limits in our ability to do that given current technology.

Mr. Alistair MacGregor: Thanks, Mr. Graham.

I just want to get in another quick question with you as well.

This is the first day of our study, and we have been focused a lot on emissions, but I also want to talk about water quality, because that's also an important part of this study.

What can you tell us about the efforts you've made with respect to water quality. We know that runoff, in the past, has been pretty devastating to aquatic bodies of water, and there are major efforts to clean up some of our major lakes within Canada. Those water bodies can suffer from eutrophication, excessive algae growth.

Can you tell us anything about the trend lines over the last number of decades? I know that the 4Rs play a big part of that, but is there anything else you can tell us on that in the next minute?

Mr. Clyde Graham: Maybe I would defer to Tom on that, but you're right that the 4Rs do improve the efficiency and reduce loss of all the nutrients, including phosphate, which is a driver of algal blooms.

Tom.

Dr. Thomas Bruulsema: Certainly the 4R program is relevant to nutrient losses that may impact water quality. I've been involved very intensely for almost 10 years now with Lake Erie and the issues of recurring algal blooms in the western basin of the lake, which occur from agriculture from both the U.S. and Canada.

The first certification program for our nutrient stewardship was established in response to that, and it's still an active and growing program in both the U.S. and here in the province of Ontario in Canada.

By ensuring that the phosphorus is applied at the right time and in the right place has just as much influence on the amount being applied; in fact, it has even more on the losses of the dissolved phosphorus that impact the lake.

We're continuing to do more research as well in both Ontario and in Manitoba with regard to the Lake Winnipeg situation as well.

● (1245)

Mr. Alistair MacGregor: Thank you.

My final question is to CropLife Canada.

In the opening statement you made mention of gene editing and the role it can play in building resistance to the ravages of climate change.

In the final minute that I have, can you provide some tangible examples of how that's worked, just so that our committee can use those as examples, please?

Mr. Ian Affleck: Absolutely. Thank you.

One great example is just recently the Government of Saskatchewan has invested \$300,000 with the Global Institute for Food Security for nitrogen efficiency.

This is the tool that Mr. Graham spoke about where plant varieties can work hand in hand with the 4Rs to help in the right place at the right time and help meet those goals.

As we look toward more resilient plants that can manage climate change—so you're getting greater productivity per hectare, protecting those green spaces—we see that the practice of plant breeding is about getting better varieties in the hands of farmers, and gene editing is just one more tool in the tool box that's going to help plant breeders continue to equip farmers with that moving forward.

With that, I'll put in a short statement that we are making great progress on clarified guidance around these products with the Government of Canada. It has stalled a little bit on the finish line. The policy is completed but is yet to be posted. It was due December 8, and we're waiting for it, but it's an exciting time to unleash more of those tools where they can continue to help with those environmental targets.

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

We're going to go to Mr. Falk now for five minutes.

Mr. Ted Falk (Provencher, CPC): Thank you, Mr. Chair.

Thank you to our witnesses this morning for your presentations and for all that you do for Canadian agriculture. We appreciate it.

I'm going to start with CropLife Canada, if I may. Dr. Taylor, in your opening comments, you mentioned that in the last 40 years our GHG emissions have remained relatively stable, whereas our crop outputs have increased.

Do you have ratios on GHG per bushel, or any data like that available?

Dr. Justine Taylor: That data came from Agriculture and Agri-Food Canada. I believe in the same work where they presented that result, they have it broken down per crop. You would be able to find those specific details.

Mr. Ted Falk: That's very good.

Is there also data available for the emissions that are produced by agriculture and how much of that current crop absorbs or sequesters those emissions?

Dr. Thomas Bruulsema: Crops absorb carbon dioxide from the air. That's a very important point, because it's photosynthesis that limits the carbon that's available to build the carbon in the soil. It's only when the carbon is sequestered in the soil that it's considered taken out long enough, because everything that crops produce eventually gets consumed by a cow, or by people and is transferred back to CO₂.

In a sense, it doesn't count, but the part that gets sequestered in the soil is the part that counts.

Mr. Ted Falk: Do we have data on that?

Mr. Ian Affleck: I might add to that, Ted.

You're asking great, specific questions. Stuart Smyth, a researcher at the U of S, is currently mapping a lot of these exact numbers right now through the western provinces, because we have intrinsically known a good deal of this to be true, but the specifics are so important. We're seeing that information roll out more and more of our research institutions right now.

Dr. Thomas Bruulsema: Mr. Falk, to answer that question of whether we account for it now, the Canadian national inventory currently counts for some carbon sequestration, particularly in western Canada soils. What it does not count is farmer activities that may have an influence. Known activities, like the use of nitrification inhibitors, are not reflected in the national inventory.

● (1250)

Mr. Ted Falk: We still have some work to do in that regard.

Dr. Thomas Bruulsema: Agreed.

Mr. Ted Falk: Very good.

I will shift over to Fertilizer Canada now. In your opening comments, you also indicated that we're going to need a 50% increase in food production from 2005 levels to meet anticipated world population levels.

Sixteen years later, having finished a 2021 crop year, how are we doing?

Mr. Clyde Graham: This has been a challenging year. I don't have the exact status, except that I think, generally, agriculture is increasing its yields. The key thing we have to do—we've had the discussion about biodiversity—is sustainable intensification.

We can't really produce.... All of the good farmland in the world is more or less under cultivation right now. If we can't find ways to grow more food on that existing land base, hungry people will cut down forests and they will drain swamps, wetlands and other habitat.

We're progressing to probably achieve the increase in food production that will be required by 2050, but we have to be very careful about how we do it, so that we don't affect other important environmental imperatives.

Mr. Ted Falk: As a follow-up on that question, the farmers I know in my region are very fertilizer-sensitive. Especially with the cost of fertilizer today—it's pretty much double what it was even a year ago—they are not going to put any more fertilizer in the ground than yields a return.

My question is whether you are seeing more and more smart applications. I looked at some technology a couple of years ago where every square foot of a field was being analyzed and there was application based on every square foot of the field from a fertilizer perspective.

Are you seeing more and more of that, where farmers are being much more...not only cost-sensitive, but environmentally friendly, so as not to over apply?

I guest that would be part of 4R.

The Chair: You have 20 seconds left.

Mr. Clyde Graham: I think 4R is being adopted. I think various practices under 4Rs are improving. It took 20 to 25 years to get zero till recognized as a key practice. I think we're coming up to about 16 years on the 4Rs right now, so I think we're making good progress.

The Chair: Thank you, Mr. Graham.

We're going to go to Ms. Valdez, please, for five minutes.

Mrs. Rechie Valdez (Mississauga—Streetsville, Lib.): Good afternoon, Chair.

Thank you to all the witnesses who are here today.

I personally appreciate all the work you do, because you are at the forefront of innovation in a way that reduces the impact of climate change in agriculture. Thank you so much for that.

My first questions are for CropLife, either Mr. Affleck or Dr. Taylor.

Can you explain what regenerative agriculture is and how plant science supports regenerative agriculture?

Dr. Justine Taylor: Ian, do you want to take this one, or would you like me to? I'll start, and then I'll throw it over to Ian.

It's a good question. Regenerative ag itself is a little bit nebulous in terms of a definition. There seem to be a lot of interpretations of what is or is not encompassed and what are the must dos and the nice to dos, but in general the use of our tools, in our belief, supports the concept and the philosophy behind regenerative agriculture, which is no-till, cover crops and ensure that you're protecting those natural spaces on your farm. From our perspective, we believe our tools and future innovations, for that matter, would be in alignment with the philosophy behind regenerative ag.

Mr. Ian Affleck: Yes, I think if regenerative ag, at the end of the day, is about making your soil better than you found it, all of our tools are.... That's an agricultural goal to start with, as Ted talked about. His members are all looking to make their soil better than when they started.

The danger there—and I think this applies to the broad discussion—is that, if ideological policies trump science-based policies, then you can start applying systems to regenerative agriculture that might not lead to your outcomes.

I think I'd link that to what we've seen in Europe with their farm-to-fork policy. There are great end goals they might want to hit by making the world a better place, but, if you allow ideological policies rather than science to lead, it falls apart rather quickly. We've seen with the instability in Europe with Ukraine that they've hesitated to install the policy, and they've rolled back some of their measures that they had before, because they weren't really science-based measures that took into account that productivity element that was mentioned before.

As we move forward with climate and environment goals, we have to bring that productivity element with it, as Clyde mentioned, or it won't withstand any variability that we encounter, whether it be world markets, droughts or you name it.

• (1255)

Mrs. Rechie Valdez: Thank you so much for that.

You kind of touched on a few things, but I really wanted to know what the long-term benefits are with using regenerative agriculture.

Mr. Ian Affleck: I think I can give an example from growing up on a potato farm. I know that, when we had a bad field that wasn't performing well, my dad would go with a couple of years of rye grass, plow it down and bring the organic matter back up. That's the whole idea of regenerative ag: look for ways to enrich the soil, keep the carbon there, and keep the organic matter there in any way possible. When you can use better crop protection tools and better varieties, that's going to allow you different pathways to get to that same outcome.

Investing in your soil is like investing in the bank. That's where the crop productivity comes from, and the more healthy the soil, the better off we are. I think innovation is what's going to get us there, as there isn't any magic wand that's going to deliver it. It's going to be a combination of different innovative tools and practices.

Mrs. Rechie Valdez: Thank you, both, so much.

Mr. Nault, congratulations first on all of your progress and success.

An expert said in an article that, if we treat soil carbon as a renewable resource, we can change the dynamics. Can you share what your organization's technologies are doing to enable farmers to understand their soil and how that helps them in their future planning?

Mr. Jacques Nault: It's an interesting question.

The technology that we've developed is a technology to measure soil organic carbon. We use laser technology. Like I said, we won the Indigo Ag carbon challenge in 2021.

At the end of the day, it's very simple. Mr. Affleck touched on this. Increasing soil organic carbon is a question of returning a lot of fibre and biomass back to the soil.

If I can jump in about your previous question about regenerative agriculture, basically the idea is designing farm systems that generate a lot of biomass, and the effect is an increase in soil organic carbon at the end. Our technology—

The Chair: My apologies, Mr. Nault and Madame Valdez. I even gave you a few extra seconds.

We are almost at time.

I would ask that if possible, Mr. Perron and Mr. MacGregor, you try to keep your questions to two minutes.

[Translation]

Mr. Yves Perron: Mr. Chair, I'll ask my questions quickly.

Mr. Nault, in the last round of questions, we were figuring out a way to acknowledge the contribution of producers who have been innovators in the past. The argument that we shouldn't look far into the past no longer holds water.

I'll give you all the time that I have left.

Mr. Jacques Nault: The idea is to determine how we can compensate the farmers who are already performing well.

I don't have enough time to explain the process in detail. Basically, we form groups and share the current performance of the best farms with the farms starting their climate transition. In return, the farms starting their climate transition will make further gains in terms of increased carbon storage and greenhouse gas reductions. They'll share these gains with the farms that are already performing well. It's about sharing performances. The performance of the better farms helps to offset the performance of the weaker farms. It's like a mini cap-and-trade system.

Mr. Yves Perron: Okay.

We can do that, and do it well.

I'll let you finish your explanation for Ms. Valdez.

In your opinion, should the federal government be involved in funding the organic standard?

Mr. Jacques Nault: It's absolutely essential. The organic standard enables organic agriculture producers to obtain recognition for their products and to keep their certification. The producers are already paying for the certification. They can't be asked to also cover the costs of updating the standard.

• (1300)

Mr. Yves Perron: That's fine.

I would like you to elaborate on your explanations for Ms. Valdez.

Mr. Jacques Nault: I was talking about regenerative practices, which seek to increase soil organic matter. This organic matter plays four major ecological and systemic roles: water retention; erosion protection; pest protection; and the improvement of biodiversity. A healthy soil rich in biomass and organic matter increases soil biodiversity, a buffer in the fight against climate change.

The Chair: Thank you, Mr. Perron and Mr. Nault.

The last speaker, Mr. MacGregor, will have the floor for two minutes.

[English]

Mr. Alistair MacGregor: Thank you, Mr. Chair.

Mr. Affleck, I want to continue on the line of questioning from where we left off.

With respect to two things, trying to get more carbon into the soil, and specifically making plants more resistant to extreme weather events like droughts, which we have seen in the Prairies, but also larger amounts of rainfall, what specific characteristics of plants are we trying to develop here? Is it as simple as trying to find a variety which is leading to a bigger root mass or roots going deeper into the soil? I'm curious. Can you expand a little bit more on that?

Mr. Ian Affleck: If you take droughts, for example, it could be the way that the root system grows; it can also be the way that the leaf responds to the high temperatures. Closing the stoma loses less moisture out of that.

Then there are also two elements: one is drought resistance, but then there is water efficiency. If you're under an irrigated system, you have to use less water in order to get as much output, or just straight-up drought resistance that can handle the heat and still provide you with a decent crop at the end of the day, which kind of stabilizes your food production across the board.

All the time, as you're using things like gene editing, etc., to benefit conventional plant breeding, you're moving those yield sticks forward, 2%, 3%, 4% a year. That's the compound interest that brings us the efficiencies we talked about earlier in terms of reducing our greenhouse gas emissions per pound of food, if you will.

Mr. Alistair MacGregor: Thank you.

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

Thank you, witnesses, for your testimony here today. I'll reiterate what I said to the first panel. Thank you for your leadership in agriculture and thank you for making the time to help enlighten and engage us on a really important topic.

With that, colleagues, I will bid you adieu.

I have one final word, for our interpreters. Thank you so much for the work you do. We certainly appreciate it.

We'll see all of you back here on Thursday.

Take care.

The meeting is adjourned.

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