



# PASSPORT

*OPENING THE GATES OF PROFESSIONAL DESTINATIONS*



FEB 2020 #1

# AGRICULTURE SECTOR

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**CANADA**  
BUSINESS EVENTS



# YOU ARE HOLDING YOUR NEW PASSPORT

BY MARCEL A.M. VISSERS - EDITOR IN CHIEF

HQ aims at 'building bridges in the meeting industry'. From Brussels, the capital and beating heart of Europe, we can bring you quality content marked by substantive research and keep you informed about the latest trends in the ever-changing meetings industry.

Now, what you are holding in your hands is our latest product: what you need in the mission towards your next event. It will be 'opening the gates of professional destinations'.

Since 1992, HQ has been an exciting voice to promote the MICE industry. While we know that print will never lose its fascination, our visual style shows an injection of youthful spirit.

That's why we launched 'Passport'.

Giving our database some thought, we discovered something brilliant. Our files contain many addresses of associations that are active in the agricultural sector or products derived from this. We decided to flip the question around. Should we continue putting the destinations first – or would it be better to shed light on the associations in the promotional process?

We hope to help associations go through the right passage to a leading destination in their field. Every branch of industry is a gateway and there are thousands of them in the world of associations. We will be opening many of these gateways for organisers of conferences to show the way, with regard to how congresses and specialised conferences can be the beginning of a brand new economic asset.

After all, you must not forget that we are entering an era where the number of associations and destinations are expanding rapidly.

Here, enjoy our creation and your trip in the world of agriculture!



# AGRICULTURE

It's not just the human activity that fills our stomach. It's an art. And it's a science at the same time.

Agriculture is the art and science of cultivating the soil, growing crops and raising livestock. So it provides food and materials for the entire world.

The history of agriculture started about 11,500 years ago, when people learned the advantages of farming and started to enjoy the benefits of a regular life over hunting and searching for food. Over centuries, the growth of agriculture contributed to the rise of cultures and shaped new relationships. About 2,000 years ago, much of the world's population had become dependent on agriculture.

Subsequently, they also began herding and breeding wild animals for meat and dairy products. While the first domesticated plant is likely to have been rice or corn in China, the first domesticated animals were dogs followed by sheep and goats.

Food surpluses allowed people to make trades and economies developed as a consequence, with the earliest civilisations based on intensive agriculture arose near the Tigris and Euphrates Rivers in Mesopotamia and along the Nile River in Egypt.

In the 15<sup>th</sup> and 16<sup>th</sup> centuries, explorers introduced new varieties of plants and agricultural products from one side of the world to the other - really beginning the process of globalisation.

Then the Industrial Revolution gave agriculture a spin, enabling people to produce food easier thanks to machines. After the Second World War, hunger was thought to be about to disappear.

At the present time, agriculture is still far from reaching the result of feeding the world and is rather going through new challenges.

A report from the United Nations warns that the number of hungry people worldwide increased for a third consecutive year in 2018, and now exceeds 820 million. The climate crisis is already damaging the environment and people living within it, demanding us all to look for sustainable alternatives. Automation and urbanisation are predicted to change the job of farming.

This Passport is here to help readers navigate a complicated era for our planet and its (fragile) potential.



# AGRICULTURE GLOBAL EVENT AGENDA 2020

| Event  | Date           | Destination      |
|--|----------------|------------------|
| Global Forum for Innovations in Agriculture                              | 09-10 March    | Abu Dhabi, UAE   |
| Natural & Organic Products Europe  |                | London, UK       |
| The IRES - International Conference on Food and Agricultural Engineering | 19-20 April    | Bali, Indonesia  |
| Urban Agriculture 2020   | 29-30 April    | Valencia, Spain  |
| International Food Exhibition and Import Food Exhibition                 | 03-05 June     | Guangzhou, China |
| CEJA Working Group and General Assembly                                  | 22-23 June     | TBC              |
| International Conference on Agricultural and Biological Science          | 23-24 June     | Miami, USA       |
| The International Conference on Agricultural and Biosystems Engineering  | 25-27 July     | Montreal, Canada |
| Food and Agri Executive Management Program                               | 02-13 August   | Ithaca, USA      |
| International Conference 'NANOFORAGRI 2020'                              | 05-06 November | New Dheli, India |



# SUSTAINABLE AGRICULTURE IN EUROPE: SORTING THE WHEAT FROM THE CHAFF

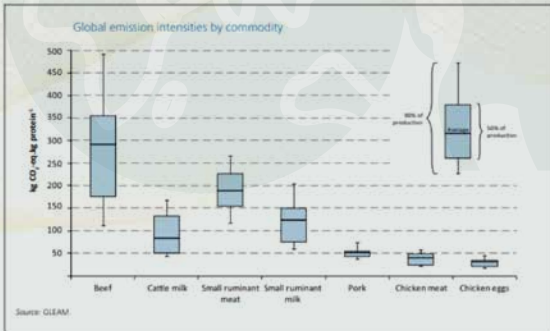
BY NICOLAS SOLONAKIS

In the storm of environmental awareness that has been blowing over Europe in the last two decades, agriculture has come in the spotlight of new policies. The increasing interest towards our food production systems is salutary in a context of nature depletion and food-related health issues. However, the regular accusations of major Greenhouse gases (GHG) emissions and water resource capture by livestock are based on highly biased data, while the consequent recommendations of reduction in livestock raising and meat consumption to render agriculture more sustainable might well yield the exact opposite result. Here is why.

First, let's talk about numbers. The agricultural sector is often blamed for being responsible for some 14.5% of total GHG emissions worldwide, which would make it the third most important sector of GHG emissions behind transport and industry, according to a 2013 scientific report by the UN's Food and Agriculture Organization (FAO). Yet, a closer look at this report tells a somewhat different story: this 14.5% GHG emissions actually includes energy uses, manure management, as well as transport and processing-related GHG emissions<sup>1</sup>. These elements are therefore not incompressible emissions, and result from the way agriculture is conducted in some parts of the world, not from agriculture per se. A separate study by the European Environmental Agency lowers this number to 9.6% in European agriculture, of which, only about 6% are actually incompressible (enteric fermentation and a share of emissions from agricultural soils). There are two main reasons for such variability in GHG emissions: first, not all agricultural production uses the same amount of fossil fuels (higher in American agriculture, for instance); second GHG emission levels also depend on the type of meat produced (cf. figure on the left).

Nicolas Solonakis studied History, Political Sciences and Geography at the Université libre de Bruxelles. After the completion of his PhD in 2017, Solonakis focused on agriculture and food supply in the Roman Empire, then worked as a consultant on sustainable agriculture and is currently a post-doctoral researcher in Ancient History at the University of Bordeaux-Montaigne

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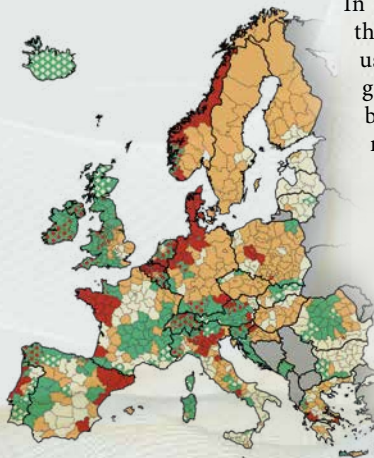


But GHG's are not the only thing agriculture is blamed for. Another concern is about the famous 15,000 liters of water said to be required for the production of 1 kg of meat. Here as well, we face the double issue of clumsy methodologies and tyranny of averages. The question always to be asked in the face of such striking numbers is: how were they obtained in the first place? The answer is worth the painstaking effort of statistical scrutiny: these 15,000 liters per kilogram of wheat actually include a considerable part of rainfall water, which would have fallen on a parcel of land with or without farming, and hardly takes into account the share of used water that goes back to its natural cycle. A note by the French Institute for Agricultural Research (INRA) thus concludes that, on average, 1 kg of meat requires 550-700 liters of water<sup>2</sup>.

In fact, both for GHG emissions and water consumption, the critical parameter is the *type of farming practices* in use: fossil fuel use, primary animal food (fodder crops, grass...), number of animals per surface unit, etc. As can be shown in the map on the left made from another INRA report<sup>3</sup>, a considerable part of European agriculture is made of low to middle animal density units - a large part of which is fed on grass.

In the light of these statements, recurring claims to reduce livestock raising and meat consumption appear much more ideology-grounded than science-based. What actually *should* be reduced in order to improve agricultural sustainability is highly mechanised capital-intensive livestock, not livestock in itself. In fact, in the context of dominant mixed farming, as in Europe, the first consequence of livestock reduction is the fewer availability of organic manure.

Farmers are thus left with two options: either accept lower yields, which will usually imply increased levels of deforestation to maintain output, or supplement organic manure with synthetic fertilisers which cause dramatic soil pollution... Everything comes at a cost.



Typology of breeding areas

- High animal density, little grass
- High animal density, grass
- Average animal density, grass
- Low animal density, grass
- Coexistence of arable cultivation & livestock
- Low animal density, little grass
- No data

- [1] Gerber, P.J. et al. (2013), *Tackling climate change through livestock – A global assessment of emissions and mitigation opportunities*, FAO, Rome, p. 7.
- [2] M.S. Corson et al. (2013), 'Évaluation de l'utilisation de l'eau en élevage', *INRA Prod. Anim.* 26 (3), pp. 239-248.
- [3] J. Hercule et al. (2017), 'Une typologie pour représenter la diversité des territoires d'élevage en Europe', *INRA Prod. Anim.*, 30 (4), 285-302.



# AGRICULTURE TECHNOLOGY: IS 'NEW' ALWAYS BETTER?

BY NICOLAS SOLONAKIS

From the onset of agricultural societies about 8,000 years BC down to the medieval agricultural revolution, farming technology remained virtually unchanged. Of course agrarian practices did evolve and underwent substantial diversification – slash-and-burn systems, mixed farming, agro-pastoralism, etc; the technology they were relying on, however, changed very little<sup>1</sup>.

Only between the 18<sup>th</sup> and 19<sup>th</sup> century with the agricultural revolution, which fostered and accompanied the industrial revolution, did agricultural technology experience drastic changes. These included the invention of the automatic thresher and harvester, as well as the development of synthetic mineral fertilisers. Combined with the practice of enclosures to limit the loss of manure, and the switch towards a 4-year crop rotation to allow the gradual suppression of fallowing, yields increased considerably in Europe between the early 18<sup>th</sup> and mid-19<sup>th</sup> century, eliminating the threat of famine which had haunted Europeans since antiquity. These developments initiated a trend of innovations that continued throughout the the 20<sup>th</sup> century with the varietal selection of high-yield crops, genetic modifications and synthetic pesticides to reduce pre-harvest losses.

In the context of today's environmental issues, it is worth wondering whether technological innovation could improve our lives further and provide a path towards more sustainable agriculture. The answer, though, is not straightforward.

In fact, several of today's agricultural problems are partly the consequence of overly technology-dependent farming.

For instance, soil depletion starts with the dramatic contraction of microbe, fungi and earthworm populations, which are the three main living organisms literally 'crafting' the soil and whose increased scarcity owes much to synthetic fertilisers and pesticides. In-depth ploughing also plays a role by reducing the availability of organic matter.

Another example is water pollution as a consequence of soil depletion, since the soil and plants can no longer retain minerals (nitrogen and phosphates among others), but it obviously originates in the excessive use of synthetic fertilisers, combined with deforestation. Air pollution, together with GHG emissions, on the other hand, are mostly due to highly-mechanised farming which largely depends on the use of fossil fuels.





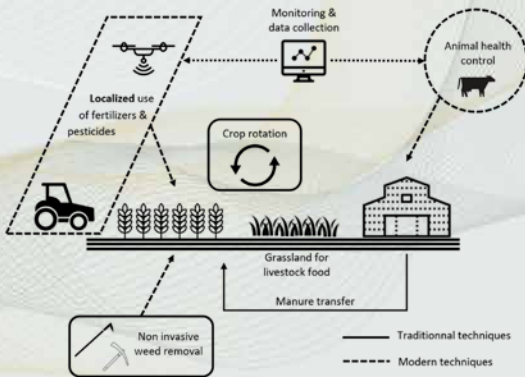
A large part of these issues results from the never ending quest for higher yields, which to a certain extent also follows from the ever increasing artificialisation of soils. However, in many developed countries where modern agricultural systems and substantial unemployment prevails, seeking higher yields is not the best path to solve environmental or social issues.

Reducing pesticides use and synthetic fertilisers use will in the short run reduce yields (while improving quality). In order to compensate for this and at the same time not extend arable surfaces at the expense of natural ecosystems, the best way is to rely on a larger labor force. Therefore, agricultural innovations<sup>2</sup> that are geared towards (or indifferent to) off-soil, high synthetic input use will be part of the problem, rather than the solution.

Yet some innovations open interesting perspectives. Drones, for instance, can be used to target pesticides and fertilisers on the parcels or crops that require them most and to release such products with much higher precision, hence avoiding overuse.<sup>3</sup> However detecting unhealthy vegetation and concentrating agrichemicals on them still doesn't solve the root of the problem which is long-term soil depletion. Some other efficiency-oriented innovations include sensors to better track animal health among herds,<sup>4</sup> or digital devices to monitor machines in the context of mechanized farming.<sup>5</sup>

In order to address the most crucial issues in western agriculture, the best innovations probably lie in preserving and supporting to long-standing practices: crop rotation instead of large-scale monoculture, mostly grass-fed ruminants tightly integrated to arable cultivation in order to maximise available manure, non-invasive removal of weeds, and in some context minimal surface ploughing (called Simple Cultivation Techniques, SCT) or direct sowing in order to limit soil compaction...

As the old French adage goes: the best soups are made in the oldest pots.



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- [1] For a reference book on the evolution of agricultural techniques : Mazoyer, M. & Roudart, L. (2002), *Histoire des agricultures du monde : du néolithique à la crise contemporaine*, Paris, Le Seuil.
- [2] A list of EU startups developing AgriTech is available here : <https://www.eu-startups.com/2019/08/agtech-disruptors-10-european-startups-innovating-in-agricultural-technology/>
- [3] Parmentier, B. (2009), *Nourrir l'humanité. Les grands problèmes de l'agriculture mondiale au XXIème siècle*, Paris, La Découverte, pp. 135-136.
- [4] King, A. (2017), 'Technology : the future of agriculture', *Nature* 544, S21-23.
- [5] See the recent report : *Digital Opportunities for Better Agricultural Policies*, OECD (2019).





# ABOUT AGRICULTURE IN LIMPOPO PROVINCE



Limpopo is South Africa's most northern province. Sharing borders with Botswana, Zimbabwe and Mozambique, it is favourably situated for economic co-operation with other parts of southern Africa. Limpopo Province is divided into five district municipalities: Capricorn, Mopani, Sekhukhune, Vhembe and Waterberg. The province hosts more than 3.6 million hectares of national parks, nature reserves and game farms, making up 70% of South Africa's protected land.

Limpopo is the food basket of the country. As shown on the charts below, the province contributes large percentages of agricultural products in South Africa.



South Africa's annual export of citrus averaged nearly 90 million cartons. Limpopo yields more than a third of the country's production and the key area is Letsitele, Mopani district, where semi-tropical conditions are ideal for the cultivation of this crop.

Limpopo also plays a major role in contributing to the country's excellent export record: avocados, mangoes and macadamia nuts from the province's eastern regions. These goods are hugely popular in international markets. The province supplies more than 50% of the worldwide demand for avocado oil. Recently, two new blueberry farms were established in Tzaneen area, Mopani District, which has added another choice to Limpopo's already impressive production list.

According to the report from Limpopo Department of Agriculture and Rural Development (LDARD), agriculture is interrelated to most of other sectors of Limpopo economy. Manufacturing contributes about 27% to final agriculture output (that is, some agricultural output requires input from manufacturing sector). On the other hand, about 15% of final agricultural output is used as input in the manufacturing process.

Trade contributes about 5% to the value of final agricultural output, followed by transport (3%), financial business (1%). The agricultural sector encompasses not only the primary agricultural production but the pre-input and input sectors as well as financial, marketing and agro-processing (manufacturing) sectors.

Limpopo hosts a dual agriculture style, namely subsistence and commercial. Many companies, such as NTKLA, Afgri, Granor Passi, Kanhym, Westfalia and Enterprise Foods, have chosen Limpopo as their backyard. One of the biggest local farming enterprises and fresh product companies, ZZ2 farms, are based in Limpopo Province.

### **The sector's potential**

As the Limpopo Economic Development Agency (LEDA) pointed out in the *Limpopo Business*, a journal about the business and investment environment of Limpopo Province in 2019, primary agriculture and logistics hub is a direction for investment.

The logistic hub in the Musina-Makhado Special Economy Zone will provide a facility for processing, packaging and distribution for both domestic and overseas export markets. With the development of the logistics hub, employment opportunities will be created, which is currently another main goal of the province. That's why the Industrial Development Corporation (IDC) believes that Limpopo Province holds a bright future in agro-processing field.

The Provincial Government of Limpopo has included RAAVC (the revitalisation of the agriculture and agri-processing value chain) into the nine-point economic plan. Moreover, national government's Industrial Policy Action Plan (IPAP) acknowledged agri-processing as one of the best sectors for labour-intensive growth. More support for farmers came in the allocation of R32-million by the provincial government for the construction of the Molemole Agricultural Office in the Capricorn District Municipality.



### Call for support

The noticeable development of the agriculture sector in Limpopo Province has come to the spotlight. However, there are major challenges to overcome. These include the shortage of available water and the high utilisation of water, high input leads to low output.

Corruption and ballooned-up-projects are also difficult to be controlled, although the South African government intends spending R900 billion (€ 56.1 billion) in the new decade. For instance, the real reason behind the failure of the R3 billion (€187.1 million) Giyani water project last year is still unclear and 108 villages in Limpopo are still without basic water supply.

On top of the financial support and the supervising from the government, a full scale of appropriate and effective training programs should be arranged from home and abroad. From employing agricultural specialists to collaboration with international organisations for research, knowledge exchanges, educations, Limpopo has just begun its long journey in the agricultural field.

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#### MORE INFORMATION

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# THE NEW FARMING: HOW TO BE YOUNG, EUROPEAN AND PRODUCTIVE

“As an organisation that represents young farmers around Europe, CEJA is a platform to make the voices of its membership heard,” CEJA Communications Officer Fiona Lally says proudly.

CEJA is the European Council of Young Farmers, founded in Rome in 1958 and standing for around two million young farmers from 32 national organisations and one associate member across 23 member states and Serbia. Its main aim is to represent the interests of young farmers to EU institutions and stakeholders.

In brief, CEJA does three main things:

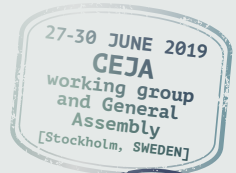
- Raises the issue of generational renewal in agriculture to the general public, key decision-makers and other stakeholders.
- Acts as a facilitator in discussions between stakeholders across the food chain.
- Provides a networking platform for young farmers in Europe to exchange views on farming, policy perspectives and agricultural matters.

It is structured around three bodies: its member organisations, a Presidency composed of five young farmers from around the EU, and a Brussels-based Secretariat that carries out lobbying, advocacy and campaigning activities in order to further CEJA’s cause.

And three are also the major challenges faced by young European farmers: access to land, access to credit, and access to education and training. However, there are other hurdles they must overcome that are specific to their type of farm or Member State. These include competition on the global market, lengthy administrative procedures to apply for funds and a sometimes weakened position in the food supply chain.

“As an organisation that represents young farmers around Europe, CEJA is a platform to make the voices of its membership heard,” Lally says. “Through regular working groups, delegates develop common positions on topics they believe are relevant. These positions are then used by the Presidency and Secretariat in advocacy, lobbying and campaigning activities aiming to further CEJA’s cause.”

According to Eurostat, in 2016 only 5.1 percent of farm managers in the EU were under 35 years of age - showing the uncertainty surrounding future generations in the sector.





In 2017, CEJA published a report called “European Young Farmers: Building a Sustainable Sector” in collaboration with DeLaval. The research, gathering data from a survey completed by around 1,000 young farmers from all over Europe, showed that a fair income level is the first most important factor for the development of an economically sustainable farm. Respondents also identified access to education and training, social opportunities, adequate internet coverage and transport connectivity, as essential to leading a vibrant and sustainable life in a rural community.

The economy moving faster and faster towards urbanisation and other kinds of jobs, in a trend that has become increasingly prominent in recent years and one that needs to be faced at all levels, from the grassroots to governance.

“If a place does not offer people certain opportunities and services to its inhabitants, they will move away. This is a great pity because rural areas have a lot of economic, social and cultural potential,” Lally says. “Rural areas must be viable places to live so people will choose to move to or remain in them.”

CEJA discusses subjects that range from climate change to international trade and youth in rural areas. The organisation also participates in EU-level projects with partners from different countries, always concerning topics that are of relevance to young farmers.

Climate change is the main point on CEJA’s agenda at the moment and the organisation is currently developing its position paper on the topic.

In November 2019, CEJA and the World Farmers’ Organisation (WFO) organised the European Regional Workshop of the Climakers Alliance, a global union of farmers and agricultural sector stakeholders working together on climate change. They showcased best practices from farmers working on livestock, carbon and adaptation, as well as reflections on what remains to be achieved. The workshop highlighted how agricultural sector stakeholders consider climate change to be of major importance and the need for a united approach to find solutions.

“Young farmers are passionate, dynamic and aware of the hurdles they must overcome, whether these are directly related to their demographic, such as access to land and credit, or are global challenges that require a cross-sectorial approach, such as climate change,” Lally adds. “They want to farm in a way that is as sustainable as possible, but need assistance to face certain difficulties if they are to remain in the sector.”



# “AGRICULTURE WAS THE FIRST TRUE PAN-EUROPEAN POLICY”

With the rise of new technologies, the agricultural sector is preparing to enter a new digital era in which climate change is not the only scientific threat. Who better than Hans Siemes, Chairman of The European Network of Agricultural Journalists (ENAJ), to tell us more about all these disputes facing the future of the industry.

*The mission of the ENAJ is to facilitate networking, inter-association projects and the exchange of information. What is the state of play of the industry around the continent?*

It's an underestimated pillar of the economy and social life of the European Union and the EFTA countries. Millions of people owe their existence to agriculture, horticulture and forestry and the agricultural industry. They care about an attractive countryside and a vibrant country society. Farmers and the agricultural industry provide the European population with food that's guaranteed to be of high quality – and then they provide the rest of the world with food. There is less hunger in the world and no hunger in Europe thanks to European farmers and agricultural industry.

Agricultural journalists and communicators play an important role in disseminating information and the real facts about food and farming, not only in the sector, but building bridges between farmers, industry and society.

*What are the main political guidelines and regulations that your associates are pulling into the agenda for the next decade?*

Climate change above all else. Farming has to acknowledge its role in production of greenhouse gases, but is also unique by playing an important part of the solution. Research and development is crucial in identifying innovative and technical solutions that can produce food while lessening the impact on the environment.

Digitisation is another big factor our members are reporting on. We are just at the beginning of what is possible. Genetics are another big challenge. Do we allow the production of genetically modified crops, animals and food? What about genetically modified meat substitutes? Then, there's animal welfare. Biodiversity. What should we do about the exodus of farmers from the countryside? Who should preserve the countryside?

Societal acceptance of farming is an issue. Must European farmers feed the world? In politics, through the EU's Green Deal and the Common Agricultural Policy, the next few years will see a shift towards durability and circular agriculture. In short, we have a lot of issues. We see them as challenges.

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***Big multinationals and globalization seem to be incompatible with environmental sustainability and organic farming. How do you envisage the future of the industry to be possible on a large scale?***

What you see are more or less two separate tracks: big, bigger, biggest with low-cost production at world market prices; then, farming which operates in line with the consumers' expectations and wishes, but brings higher costs and higher prices.

The economic situation will dictate how fast the second track will grow. Another economic crisis will see "big, bigger, biggest" as the winner. In some places the two tracks grow closer together. But in both tracks, the individual farmer depends on the industry and retailers who buy his products. It is not a strong position being a commodity supplier. I expect a discussion about quota systems so that farmers can have more certainty and a better price.

***With this technological shift taking place in the water sector, animal farming and cultivation, is there a risk for the industry to be divided into two speeds?***

Climate change may well make water a very important issue. Drought and bushfires will harm not only farming but society too. Both mass production and traditional will be hit. What I fear is that mass production has the most money and political influence; they can assure themselves of having enough water. Could we see a war over water, especially in the southern and eastern part of Europe?

***According to your experience, are the different destinations on the same page of the associations with regard to the most varied topics of environmental impact, scientific development and Agriculture 4.0?***

No. From the environmental aspect and from certain parts of society, there is a push to reduce numbers of livestock. Scientists think they can solve all the problems with technical solutions. Speaking of Agriculture 4.0, agriculture is always progressing: from manual labour to mechanisation, from plagues and diseases to fertilizer, plant production products and veterinary pharmaceuticals, and from small farms and small industry to larger farms and multinationals.

The big question is the next step: automation, digitalisation and genetics. How will that change the role of the farmer? He'll need to be a manager and controller in a nearly fully-automated world, rather than a craftsman who milks his cows or drives his tractor. In the past, farmers might have had a "backache"; now, they have swapped that for a "headache".

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**MORE INFORMATION**

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# ABOUT AGRICULTURE IN CANADA

Although agriculture employs less than 2% of the Canadian labour force, agriculture is vital to the country's economy. It produces large volumes of food for both the domestic and export markets and provides raw materials for food-processing, wholesale and retail industries.

How is Canadian agriculture industry having a global impact? As a world leader in pulse production and sales, Canada is the 5<sup>th</sup> largest exporter in the world with about 150 countries buying its products worldwide.

Fish and seafood exports set a record in 2016 at €4.54 billion.

Canada is also the land of mushrooms, since its annual mushroom export ranked 4 in the world.

And, as the world's third-largest pork exporter, Canada exports to more than 90 countries.

Moreover, one of the favoured healthy food by Asians - ginseng roots - is one of the exported products. Over 2,500 tonnes of ginseng roots are exported to Asian markets annually.

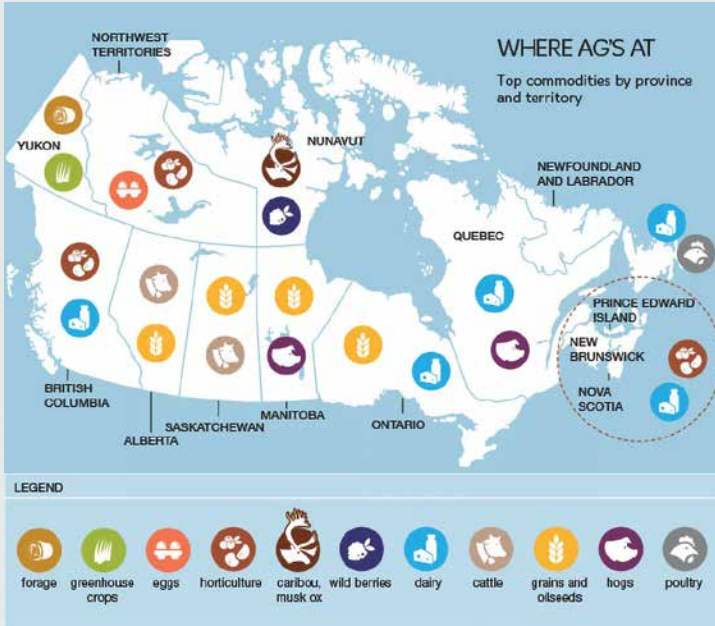
Finally, Canada is home to more than 959,000 dairy cows, that are living in over 11,280 dairy farms. Thanks to these four-legged friends, Canadian dairy sector generates over €13.75 billion annually.

## **A worldwide leader in the agriculture sector**

“When you convene in Canada for meetings and conventions, you'll be connected with the innovators who are shaping the future, the thought leaders who are leading the way, and the business and research architects who elevate Canada's position on the world stage across a spectrum of industries,” says Chantal Sturk-Nadeau, executive director of Destination Canada's Business Events team. “Agriculture and agri-food manufacturing is a key driver of Canada's economy and as such, it is an ideal springboard for networking, opening a host of new and valuable connections for your delegates, due to the close collaboration between academia, researchers and businesses in this sector.”

With abundant natural resources, diverse plant, animal and marine life, and the world's largest fresh water supply, Canada is taking the responsibility of feeding the world, today and tomorrow. Collaboration between government, universities, health institutions and the private sector is undergoing. Important industry events including International





Seed’s Federation World Seed Congress, International Wheat Congress, The International Society of Nutrigenetics and Nutrigenomics, took place in different Canadian cities.

The federal government has committed close to €3.16 million towards national food and beverage processing research. The funding will support the Canadian Food Innovators’ (CFI) research cluster. With the federal funding, a new Canadian Food Innovators Network was established last year to boost collaboration, innovation and commercialisation in Canada’s food and beverage manufacturing sector. The project will be delivered by the CFI.

“Canada’s food and beverage processing sector employs tens of thousands of middle-class workers across Canada. Our government is proud to support the efforts of the Canadian Food Innovators Network to drive innovation in this important sector, which will help businesses adopt new technologies, bring exciting new products to market, and ensure continued growth and job creation,” says Navdeep Bains, Minister of Innovation, Science and Economic Development.

“We appreciate the confidence the federal government has shown in Canada’s food and beverage manufacturing sector,” says CFI’s chair Joe Lake. “Agriculture and food have been identified as one of the biggest





February 23-24, 2018

**International  
Potato Technology Expo**

**Charlottetown**  
3,362 DELEGATES

2018

September 30 - October 3

12<sup>th</sup> EDITION OF  
The International  
Society of  
Nutrigenetics and  
Nutrigenomics

WINNIPEG  
500 delegates

drivers of growth for the Canadian economy and this funding will help us respond to evolving global demands for innovative food products and technologies.”

The network aims at connecting the agri-food innovation centres with Canadian agriculture players from the private sector to develop and scale up new products, processes, technologies and digital solutions in the sector. The establishing of this platform will stimulate the knowledge exchanges and boost new ideas within or beyond the sector.

“Using science and innovation to strengthen Canada’s value-added food industry,” says Claude Bibeau, Minister of Agriculture and Agri-Food.

Furthermore, another supercluster has been developed. The Protein Industries Supercluster will use plant genomics and novel processing technology to increase the value of key Canadian crops, such as canola, wheat and pulses that are coveted in high-growth foreign markets like China and India, as well as to satisfy growing markets in North America and Europe for plant-based meat alternatives and new food products. Building on Canada’s worldwide reputation as a leader in agricultural production, this supercluster will make the country a leading source for plant proteins and, ultimately, feed the world.

### **The future of Canadian agriculture**

With the federal investment in the innovation and technology sector for agriculture, a future of autonomous machines and digital logistics systems operated farms is going to come true in a decade’s time. The traditional agri-labour force will likely be replaced by high-skilled engineers, scientists, communication professionals and other digital experts.

According to RBC Thought Leadership, the shortage of agri-labour force in Canada is expected to be 123,000 by 2030. As the 4<sup>th</sup> agriculture revolution powered by cognitive machines and skills-savvy workforce is on the way, Canada can once again be an economic superpower and yet cut its greenhouse gas emission (GHG).

The share of Canadian’s global exports, however, fell from 6.3% to 3.9% from 2000 to 2019 and the country has been falling behind as the rest of the world is moving rapidly into a new age of production.

Thus, the adoption of innovative technologies is the way to keep the Canada’s position in the world agriculture sector. By doing this, a potential new agricultural output of €35.08 billion can be expected by 2030.

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#### **MORE INFORMATION**

[canadianfoodinnovators.ca](http://canadianfoodinnovators.ca)

[thoughtleadership.rbc.com](http://thoughtleadership.rbc.com)



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# LAND USE AT THE TIME OF GLOBAL WARMING

The world's forests are put in serious danger to make space for food production and more efforts are needed to protect and restore them. After we lost the equivalent of about 800 football fields every hour between 1990 and 2016<sup>1</sup>, how do we meet our climate goals and feed humanity at the same time?

The latest report from the Intergovernmental Panel on Climate Change (IPCC) showed that effective land management can contribute to tackling climate change.

According to the IPCC<sup>2</sup>, not only does climate change affect land use and land cover: it is also true that, on the other way around, the land and land use contribute to climate change.

“Contemporary land cover and land use is adapted to current climate variability within particular temperature and/or rainfall ranges (referred to as climate envelopes). Anthropogenic GHG emissions impact land through changes in the weather and climate and also through modifications in atmospheric composition through increased GHGs, especially CO<sub>2</sub>.”

“Land and land use change therefore alter the state (e.g., chemical composition and air quality, temperature and humidity) and the dynamics (e.g., strength of horizontal and vertical winds) of the atmosphere, which, in turn, can dampen or amplify local climate change (...). For example, deforestation in Brazil warms the surface, in addition to global warming, and enhances convection which increases the relative temperature difference between the land and the ocean, boosting moisture advection from the ocean and thus rainfall further inland.”

Moreover<sup>3</sup>, “food availability may be reduced by negative climate change impacts on productivity of crops, livestock and fish, due, for instance, to increases in temperature and changes in rainfall patterns.”

“Changing diets towards a lower share of animal-sourced food, once implemented at scale, reduces the need to raise livestock and changes crop production from animal feed to human food. This reduces the need for agricultural land compared to present and thus generates changes in the current food system. From field to consumer this would reduce overall GHG emissions. Changes in consumer behaviour beyond dietary changes, such as reduction of food waste, can also have, at scale, effects on overall GHG emissions from food systems. Consuming regional and seasonal food can reduce GHG emissions, if they are grown efficiently.”

To reach the goals of the Paris Agreement and stop global warming, it is clear that some changes must be prioritised.



Global warming will warm lands five times more than oceans, meaning that, for an average increase of world temperature of 2°C or 2.5°C, land temperature will rise about 10°C. So the great challenge is preserving soil capacity and fertilisers can then be key.

For Edward Someus, coordinator of the Swedish project NUTRIMAN<sup>4</sup>, these products have the potential to mitigate environmental impacts. “Our project focuses on the most urgent needs of farmers, pays attention to the cost/benefit aspects and stimulates the exchange of knowledge in view of fostering economically viable and sustainable agriculture. The NUTRIMAN activity is to focus on recovered bio-based fertiliser technologies, products and applications.”

Professor Erik Meers, from Ghent University in Belgium, thinks that we need circular fertilisers<sup>5</sup>: “across Europe there are areas where there is too much nitrogen and phosphorous in manure to use as fertiliser, and that’s a kind of a paradox.” He adds: “Closing the nutrient loop is one of the main challenges of the century. We need to turn those inefficient nutrients from organic sources into new chemical fertilisers based on bio nutrients and thereby make the surplus useful to meet our food demand.”

Another option is to rewild land, suggests Dr Wouter Helmer of Rewilding Europe<sup>6</sup>. “Rewilding lands could help provide all kinds of climate-related solutions,” Dr Helmer says. “For example, with new natural areas we could better store water at the source of rivers by using these lands as a sponge that keeps the area dry during the rainy seasons and releases more water during the dry seasons. There is also a reduction in flood risk within natural areas. Finally, rewilded lands store a lot of carbon, which helps mitigate the effects of climate change.”

Furthermore, we need to manage water better. Prof. Jan-Olof Drangert of Linköping University in Sweden<sup>7</sup> is well aware that the 21<sup>st</sup> century will experience an unprecedented population increase and concentration to urban areas: “these areas are hotspots for water and food demand and for disposal of used water and plant nutrients, which calls for a system-based (holistic) approach to balance these flows through the cities and connect to agriculture.”

“Now is a unique opportunity to replace business as usual and invest in sustainability, when new cities and suburbs are erected at a high rate. If societies do not act now and strive for a circular society, they will most likely have to retrofit at high costs in the near future.”

[1] [https://ec.europa.eu/commission/presscorner/detail/en/IP\\_19\\_4470](https://ec.europa.eu/commission/presscorner/detail/en/IP_19_4470)

[2] <https://www.ipcc.ch/srcl1/chapter/chapter-2/>

[3] <https://www.ipcc.ch/srcl1/chapter/chapter-5/>

[4] <https://nutriman.net>

[5] <https://horizon-magazine.eu/article/green-fertiliser-made-cow-dung-and-chicken-feathers-could-transform-big-agriculture.html>

[6] <https://rewildingeurope.com/tag/wouter-helmer/>

[7] <https://horizon-magazine.eu/article/land-use-puts-huge-pressure-earth-s-resources-here-what-needs-change.html>

