



The Académie d'agriculture de France : international ambitions¹

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1. ¹ Presentation of the principal results of the Working Group on International Activities of the Académie d'agriculture de France (2018-2020)

SUMMARY

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PREFACE

Gérard Tendron – Honorary Permanent Secretary of the Academy of Agriculture of France

The Academy of Agriculture has always shown its interest in international relations. Many members of the company have had such opportunities in their professional activities, by organizing or participating in work or conferences abroad, in particular within the European Union of agricultural academies, the inter-academic group for development or bodies of the European Union. Each thematic section of the Academy includes members and foreign correspondents who help inform the debates, reflections and proposals of their particular experience and enrich the opinions and reports of the Academy, as well as its public sessions, conferences and publications.

In order to give new impetus to this orientation, our colleague Michel Thibier kindly accepted the mission that I had entrusted to him, to set up and lead for three years a working group on international relations. My sincere thanks to him for that work.

This report embodies the reflections of the thirty academicians, representing the ten sections of the Academy, who mobilized to define five priority objectives:

- participation of the Academy in major events on the world agenda;
- participation in bilateral actions;
- mobilization of 120 members and foreign associate correspondents;
- preparation of summaries in English or Spanish of Academy publications;
- organization of an annual public meeting on an international theme.

These new orientations carry a new ambition and mark a qualitative leap in the consideration of “the international’ within our company

The French Academy of Agriculture is thus very actively involved in the changes that are essential at a time of ever more globalized exchanges in the areas of food, agriculture, health and the environment.

Gérard TENDRON

FOREWORD

M. Thibier, Member of the Academy, Section 3

The Working Group on International Relations of the Académie d'agriculture de France has been engaged in some reflection and has accomplished a lot of work since the beginning of 2018 following an engagement letter sent by the then Perpetual Secretary, Gérard Tendron to Michel Thibier. Michel led a group of about twenty members (*consæurs* and *confrères*) of the various sections² for three years (2018-2020) and a report was submitted to the governance of the Academy in December 2020.

Beyond the elements gathered in this report, the group wished to address to the Academicians as well as to all persons in relation with our company a little booklet which presented in a more convivial form, some strong elements of these three years of work. The first commitment of the group was to write a Group Project in early 2018 and this then served for the development of the Strategic Project of our company voted the following year. This group project included five axes that were developed concretely over the three years.

These five axes are the subject of the five chapters presented here. Edited respectively by G Fradin, C Regnault Roger, M Thibier, P Del Porto and G Benoit, these chapters summarize the principal elements discussed during the three years on these different themes.

Clearly upon reading these various actions, initiatives and achievements, the Academy of Agriculture has made a historic leap in its existence by being part of the global communication and intellectual exchange channels of our small global village.

This group wishes the best for future work aimed at consolidating the international influence of the Académie d'agriculture de France.

² Please see the list of members at the end of this booklet

Chapter 1

Multilateral action: intellectual and active participation of the Academy in major events on the global agenda

Guy Fradin: Member of the Academy, Section 7

The international group has set itself three objectives in this area: on the one hand, to contribute to the preparation of some multilateral events in the fields of competence of the Academy; on the other hand, to mobilize foreign partners, in particular foreign academies, as well as our associate members, for reflection and discussion on major societal challenges; and finally, to support the Academy's international programme in sub-Saharan Africa supported by GID. The international group has been able during these three years to work on a dozen or so files.

1. Action with Inter-Governmental Institutions

The first two subjects are closely linked because multilateral international action is multiple, both thematically and institutionally, complex and mobilizes many organizations, public and private, with often specific methods, operating codes and networks. That is why the targets should be restricted, on the one hand in view of international news and the challenges societal that they covered and on the other hand according to our capacities to correctly follow the preparation of selected events. Beyond the competence relating to the subjects dealt with, this ability is linked to the knowledge of the carrier institutions, to the networks they mobilize and ultimately to the time available. The mobilization of associate members of our Academy and of our colleagues from the Academies foreigners could only be more effective.

One can rightly wonder about the interest of such an action insofar as the action multilateral system is often mocked for its heaviness, even its ineffectiveness, whether in the system United Nations or outside. In fact, if we can rightly see a lot of waste, we must recognize that the system is, in the long run, responsible for a number of policy advances, institutional, financial or legal matters, indisputable; and this is at the heart of the debates of these multiple conferences or meetings that are forged a certain number of concepts and commitments structuring. For example, we can cite the Millennium Goals and then the sustainable development adopted by the United Nations or recognition of the right to water. So, it does not seem appropriate to neglect these very important places of debate and decision and for our Academy to contribute to it within our means.

The G20 meeting of November 2018 addressed food security and the need to protect soils and improve their productivity for this purpose. Our colleague Guilhem Bourrié, at the request of the Academy of Sciences, contributed to the preparation of the recommendations presented to Heads of State (dealing with governance, knowledge and cooperation).

In 2020, on the occasion of FAO's International Year of Plant Health, our colleague Catherine Regnault-Roger contributed to the organization of an international scientific conference -- a large-scale multidisciplinary project -- entitled "Plant health, one health and one world". A very wide range of national and international organizations, as well as the presence of some of our associate members, have worked to develop the systemic concept of "one health" that is today known and recognized.

Also, within the framework of this international year, our colleague Pierre Del Porto contributed to a conference on "Agriculture and the environment: plant health, human health" which addressed from a different but complementary angle the "one health" concept.

The World Water Forum, initially scheduled to be held in March 2021, has been postponed for a year. Our colleague Guy Fradin is a member of the international organizing committee for this most important event in the field of water, a place in which it is able to contribute to the political and strategic event which will focus in particular on water security as well as water and rural development. At the same time, our colleague Guillaume Benoît is a member of a specific working group on rural development in which he contributes linked to its recurring organizational work for several years on the theme water/food/agriculture/territories in the Mediterranean area as part of the annual Franco-Moroccan seminars SESAME.

A programme dedicated to the preservation of remarkable World Heritage sites is currently being developed by FAO. Our colleague Guilhem Bourrié is promoting recognition in this programme of La Crau and its hay production, which is enhanced by the two quality appellations AOC (appellation d'origine contrôlée) and AOP (appellation d'origine protégée).

2. Thematic World Congresses

Our colleague Xavier Déglise focused on the theme of the forest through a double action: on the one hand, the IUFRO congress and the collective work of the Academy ‘The forest and wood in 100 questions’; on the other hand the World Wood Day within the framework of the IAWS (International Academy of Wood Science) congress in Austria: the collective work strongly contributed to the defense and illustration of the use of the material wood, object of the meeting.



The Board of the UEAA (Union of European Academies for Science applied to Agriculture, Food and Nature) during the meeting in Florence (Italy), 23 November 2018.

3. The international organizations of which the Academy is a founding member

The Academy is a founding member of the GID and it is our current President, Jacques Brulhet, who steers our contribution. The main subject is the GID-Agri programme, launched in 2017, with its dedicated website, a college of experts and a grid for the evaluation of projects.

A Forum in 2021 will give this programme a new dimension. But the Academy contributes to many other actions, in particular within the framework of the GID-Patrimoines programme (international meetings) and the Mediterranean "Parmenides" conferences (the next in 2021 on watersheds).

Finally, the President of the group, Michel Thibier, chaired the EAA (European Union of Academies of Agriculture) until 2018 and even practically until 2020 due to the death of his two successors. Extensive work has been carried out and debates animated over the past few years under the leadership of its President: on the one hand, on the role of Gene Editing for animal and plant production; on the other hand, an open letter was transmitted to the UN and at the G 20 advocating that account be taken of the impact of COVID 19 on food security.

In conclusion, the multilateral actions of the Academy have developed significantly. If such actions may seem disparate, they have nonetheless been effective both in terms of valuing knowledge and strategic visions as well as recognition by a number of international actors for their ability to contribute to the resolution of certain global problems.

Summary: *The international group has set itself three objectives in this area: on the one hand, to contribute to the preparation of some multilateral events in the fields of competence of the Academy; on the other hand, to mobilize foreign partners, in particular foreign Academies and our associate members, for reflection and exchanges on major societal challenges. Finally the group was aimed to support the international programme of the Academy in Sub-Saharan Africa led by the GID or in Europe through the U E A A.*

Chapter 2

Bilateral actions: Costa Rica, an emblematic example

Catherine Regnault-Roger, Member of the Academy, Section 1

Bilateral institutional relations are based above all on personal relationships. The success story of the relationship with Costa Rica is based on the very active participation of a Costa Rican colleague, Marta Valdez Menara.

In December 2013, the French Academy of Agriculture elected Marta Valdez Menara, professor at the University of Costa Rica (UCR), as a corresponding associate member. With a doctorate from Pierre and Marie Curie University and then a postdoctoral fellow in Yvette Dattée's laboratory in Paris Orsay until 1988, Marta Valdez Menara is a specialist in molecular genetics and plant biotechnologies. On her return to Costa Rica, she created the CENIbiot (Centro Nacional de Innovaciones Biotecnológicas) of the UCR, a research centre dedicated to the development of biotechnologies and technological transfers in the field of bioenergy, agri-food and biomedical sciences.

A dynamic academician of the Plant Productions section, of which I was at the time the section secretary, Marta honored us with an annual presentation on the advances in biotechnology research in her country. Progress that we could compare with the French situation, which I know well, as a member of the Scientific Committee of the Higher Council for Biotechnologies since its creation in 2009. And it was therefore quite natural that during our discussions there emerged the idea of exploring further these advances by the comparative implementation of biotechnologies in the service of agriculture in Costa Rica and in France. This reflection fell naturally within the framework of the activities.

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This reflection fell naturally within the framework of the activities of the international working group led by Michel Thibier.

1. The participation of our colleague Marta Valdez in the sessions and conferences of our company

The activities in France took place at a dual level around the theme of the existing synergies between biotechnologies and biodiversity in Costa Rica:

- first, within our Academy, when Marta Valdez was invited to make a presentation of her work as part of the weekly public sessions of the Academy on 8 October 2019. This session organized by the International Group had for theme "The international opening of the Academy through multi-continental illustrations";
- and second, as part of an international conference organized on 28 January 2020 by our Academy in partnership with the Association des Amis de l'Académie d'Agriculture de France (4 AF), the National Academy of Pharmacy and the public research consortium 'DIM One Health Ile de France', during which Marta spoke during the session 'Plant health: innovate-undertake'.

2. Mission of a delegation from the French Academy of Agriculture to Costa Rica

The third part of these exchanges consisted of a mission of a delegation from the Academy to Costa Rica. This mission took place from 10-14 November 2019, around the theme of Biotechnologies for agriculture and biodiversity.

The purpose of this mission, led by Jean-Louis Bernard, current president of the French Academy of Agriculture, was to promote actions of scientific cooperation between our Academy and Costa Rican institutions.

It was organized: (1) on the Costa Rican side by Marta Valdez Melara who relied on the Research network of genetic engineering applied to the improvement of tropical cultivated plants (RIGATROP) of the UCR (of which she is a founding member), and Dr Alejandro Hernández Soto, head of the Biotechnology section of Crop Life Latin America (Central America and Caribbean), an international non-profit federation that brings together companies and professional organizations in the biotechnology and crop protection sector; and (2) on the French side, by the editor of this present overview.

The delegation was made up of members of the Academy of Agriculture of France and officials of the Association of Friends of the Academy solicited according to the very specific requests of our Costa Rican hosts, who wished to encourage high level exchanges in the most prestigious institutions of the country

Visit of the delegation to the National Legislative Assembly of Costa Rica.



Photo credit: B Ambollet

A field visit to the province of Guanacaste enabled the delegation to continue discussions with agricultural executives, teachers and managers in Cañas on the theme of ‘agriculture and the environment’ (speakers: Jean-Louis Bernard, André Fougeroux and Delphine Guey). Completing the trip were visits to farms dedicated to the production and processing of sugar cane (Banacol), pineapple (Azucarera El Palmar), cotton (BASF in Liberia) and a biotech seed production company (D&PL Semillas-Bayer), as well as an agro-ecological *hacienda* of more than 2000 ha practising organic farming (production of the only certified organic rice in Costa Rica) and ecotourism (La Pacifica).

A series of conferences at the highest level

- **at the National Legislative Assembly from Costa Rica**, at the invitation of MP Silvia Vanessa Hernández Sánchez, president of the Fiscal Affairs Committee, for a debate on ‘scientific choices for agricultural development through the prism of biotechnologies and regulatory issues’ (speakers: Bernard Ambolet, Jean-Yves Le Déaut, Catherine Regnault-Roger, Marta Valdez Menara);
- **at the National Academy of Sciences of Costa Rica**, at the invitation of Prof. Walter Fernández Rojas, its president, for a discussion on the theme of biotechnological innovations and health (lecturer Catherine Regnault-Roger);
- **at the University of Costa Rica**, where the debate chaired by Rector Henning Jensen Penington focused on technological innovations and their socio-economic consequences (speakers Henri Regnault and Marta Valdez Menara), after Jean-Louis Bernard had presented the French Academy of Agriculture and its missions. This debate was followed by a visit, led by its director, Dr. Randall Loaiza Montoya, of the CENIBiot University Research Centre;
- **at the Inter-American Institute for Cooperation on Agriculture (IICA)** in Coronado, for an international seminar addressed to IICA delegations in America (video-conference) on ‘bioeconomy, innovation and sustainable development’ (lecturers Jean-Yves Le Déaut and Alain Jeanroy);
- **at the Embassy of France**, to close this cycle of exchanges in San José, the delegation was received by his Excellence M. l’Ambassadeur de France Philippe Vinogradoff.

3. Signature of two agreements with the Costa Rican authorities

During these activities, two cooperative agreements were signed by the Académie d'agriculture de France: first, with the *Costa Rica Academy of Sciences*, with a view to supporting shared actions and visits and exchanges of publications; second, with the *University of Costa Rica (UCR)* with regard to ‘promoting research capacities and establishing a strategic relationship of mutual understanding between them, through cooperation to develop research and education programmes and exchanges of academic information -- publications, conferences, seminars, workshops and other activities in the field of scientific training.

The signing of these agreements and the bilateral exchanges mentioned above testify to the dynamism of the international openness of our Academy.

The Academy delegation is received at IICA, the Inter-American Institute for Cooperation on Agriculture.



Photo credit: B Ambollet

Summary: *The relationship between our Academy and the Costa Rican institutions is a success story thanks to our 'consœur', Dr. Marta Valdez Menara. Such an interaction took place on both sides of the ocean. She has participated in one of our weekly sessions and in a colloquium in Paris around the theme of existing synergies between biotechnology and biodiversity in Costa Rica. She also organised an excellent mission of the Academy whose aim was to promote scientific cooperation between our company and Costa Rican institutions. Moreover, as a 'première', two MoU's were signed between l'Académie d'agriculture de France and (1) the Costa Rican Academy of Sciences and (2) the University of Costa Rica (UCR).*

Chapter 3

Mobilization of foreign members

Michel Thibier, Member of the Academy, Section 3

The mobilization of foreign members is a recurring concern of our Academy, and the Presidents as well as the Perpetual Secretaries have always placed this objective among their priorities, with varying success for various reasons.

One of the conclusions that we could draw from previous experiences was that the foreign sisters and brothers only mobilized if there was a specific and particular subject to be dealt with in their area of interest.

Before the start of the COVID pandemic and from 2018, this group proposed to set up within the sections an Electronic Working Group (EWG), as exists in various international institutions.

1. The first Electronic Working Group (EWG) within Section 3

Section 3 has shown itself a pioneer, and in January 2019 began to lead an EWG which concluded its work in the late spring of 2020. It was a first for our Academy, and was a real success. The report of this group is posted on the website of the Academy (<https://www.academie-agriculture.fr/academie/sections/section-3>).

Participating in this GTE were eight fellow academics, associate members and university professors living in five different countries on four continents: Morocco, Brazil, Australia, United Kingdom and France.

The proposed theme of work was: **New tools for genetic improvement in livestock, with particular attention to genomic editing.**

It led to a particularly relevant collective reflection in three parts: the state of play, the state of research and legislative and regulatory implications. Such collaborative work has presented many strengths: it comes from senior members, fully independent from any outside influence and whose environment is diverse geographically, economically and socially. This shows the interest of such Working Groups and the scope of the remarks and proposals.

The first observation is that the world's livestock has a considerable importance in human nutrition and that place is growing. Through its social and economic impact, it underlines the considerable attention that political and economic leaders must pay to this branch of human activity: to produce quality animal proteins that are accessible worldwide.

The second is that the genomic approach to improving farm animal production is set in a context that emphasizes animal welfare and improved animal and public health ('One Health' Concept). Climate change is a key and critical point in the development of these animal productions.

Finally, this high-level scientific work, for the most part conducted with rigour and relevance, with sometimes substantial financial support, is evolving at a high rate, as the group itself has seen during the 18 months of its work. While Morocco still depends mainly on the results of genomic selection of Western countries (North America and Europe), Brazil has actively engaged through its national research institute EMBRAPA (Brazilian Agricultural Research Corporation) in the process of genomic selection.

As far as legislation is concerned, this differs markedly between countries. If the UK leaves the EU, it will actively invest in this new Gene Editing methodology. The group found that the EU was shackled by its own regulations. And at the same time, *“on 10 April 2019, the Australian government announced that genomic editing using Site-Directed Nuclease (SDN-1) techniques*

(such as CRISPR Cas 9) will not be regulated if they are only used to cut DNA in a specific location and if the natural process of cell DNA repair takes place without the insertion of any other genetic material into the cell."

2. Recommendation of the Section 3

At the end of this GTE, the group wished to present a recommendation to the Academy. Aware of the general public's ignorance of these issues, the group preferred to direct this recommendation towards the pedagogy to be assured to the public, young people and high school students in particular:

‘Based on these considerations and the experience gained by this Group, it recommends to the various scientific and academic bodies, one of whose missions is to enlighten the Society on the major current issues of Science, to raise public awareness from the School and the University to the issues of genomic publishing in the field of Animal Sciences and to explain their impacts on the evolution of the animal production streams.’



“Physical’ meeting of Michel Thibier with GTE Australian colleague Graeme Martin in front of the University of Western Australia in Perth (November 2019).

3. Lessons learned during the animation of this GTE

The choice of theme is of great importance; it is necessary that it can retain the interest of a maximum of foreign colleagues of the section, whose disciplinary competence can be very variable even within the same section ... In the case of Section 3, the subject was very technical and colleagues who were not specialists in animal genetics sometimes had to resort to their neighbouring laboratory colleagues to participate in the discussion or have found it difficult to

delve more deeply into the subject. The group recommends choosing somewhat broad and perhaps societal themes to accommodate the greatest number of foreign academics in a chosen theme.

The group can operate as a forum or through email exchanges. The first option can be advantageous if there are a large number of members. The group does not recommend this option for the Academy's GTE but rather the use of e-mail. Experience shows that a GTE works well if there are at most 12 members.

Finally, it is recognized -- and moreover classic -- that it is necessary to have some precise operating rules for such GTEs.

4. The potential for exchanges through Visio conferences

Such exchanges did not take place for this GTE since it only operated until the spring of 2020. However, it is clear that such an option is an additional means of mobilizing foreign members. Experience shows, however, the importance of addressing a very specific topic in order to interest such members. In addition, time differences sometimes increase the difficulty that Section 3 has experienced in interacting with Australian and Brazilian colleagues.

In conclusion, these GTEs are a great tool for exchanges with foreign members and the group hopes that their potential be disseminated more widely through all sections of our Academy.

Summary: *Involvement and engagement of foreign members is a recurring concern of our Academy. The implementation of an Electronic Working Group (EWG) with foreign colleagues in Section 3 was a great success. These EWGs are a formidable tool for exchanges with foreign members and the wish of the group is that their use spreads more widely throughout all sections of our Academy.*

Chapter 4

The value added internationally to the Academy's publications: the indispensable use of foreign languages

Pierre Del Porto³, Member of the Academy, Section 3

The amount of work produced by the Academy and its members (in sessions, working groups, academic notes, opinions, personal reflections) is enormous and difficult to quantify. This said, the question posed by the group was how to promote such work internationally? It seemed to the group essential to make all this knowledge available not only to French citizens but also to nationals of other countries interested in agriculture, the environment and food.

1. The essential role of translations into foreign languages

Admittedly, many written documents are already available and searchable thanks to modern techniques and now easily accessible such as the Internet, social networks, Gallica, and more recently Koha, which has been making our documentary holdings available to the world for a year.

The important thing is that everyone can easily assimilate the real content of each presentation. The role of translation is therefore essential.

The scientific world can no longer ignore the importance of using the three great Western languages. French is of course relevant to all French-speaking countries, but it is necessary to take into account the indispensable, almost obligatory role of English and even Spanish. Which international organization does not use them? On the recommendations of this working group and in 2018, the French Academy of Agriculture has therefore initiated with some success a redeployment of the provision of its work through access to data in English and recently in Spanish.

2. The different communication media.

Among the 'tools' used by the Academy to disseminate the available data, mention might be made of the following:

- the *Revue* (Journal) in paper format, which has started to include translations but which is currently dormant and for which
- the *Mensuel* (Monthly) relays part of the content to 76,000 recipients in France and abroad,
- the website, which however requires better accessibility to the work by external Internet users
- and social networks, which have become essential, but which do not replace the good traditional circuits of documentary collections, which are more secure.

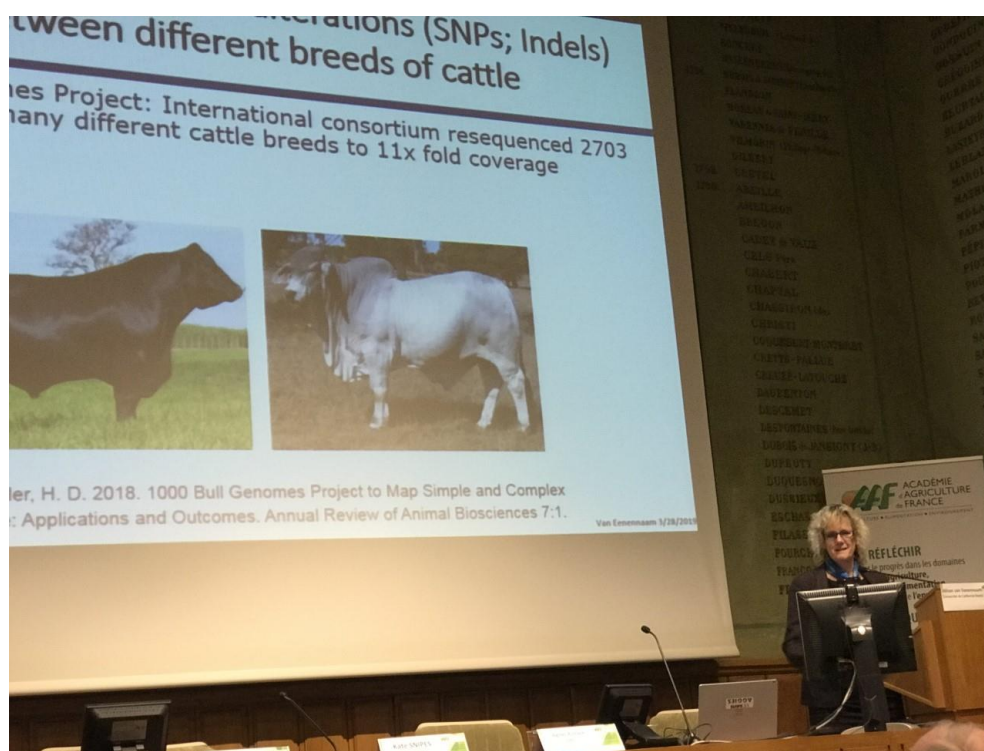
The international availability via YouTube of the sessions and conferences of the Academy ('Academy of Agriculture of France. Youtube'), now provides access (through a short manipulation on one's own keyboard or smartphone) to a subtitle, to choose among forty languages. However, it is customary to have such automated translations proof-read by one or more experts on the subject or knowledgeable people to avoid false friends that are sometimes very unfortunate and which destroy any notion of authenticity and truth.

The weekly Wednesday sessions and other conferences broadcast live, then later accessible on this channel, are increasingly frequented by foreign participants. A recent example: the session of 16 December 2020 on the work of André Voisin on pastures was followed live by 183 people

³ and Secretary General of the Association for the Study of the History of Agriculture.'

in a webinar, including twenty persons who connected from Uruguay, Brazil, Cuba and the USA. Some had been able to take advantage of the translated summaries upstream, but several regretted a lack of translation of the presentations and certain tables essential for facilitating exchanges.

The experience gained in 2020 on an experimental basis of electronic working groups between colleagues and colleagues from several countries (see chapter 3), has borne fruit in exchanging via messaging on cross-cutting themes. But it is important to facilitate the debates through translation engines, which would also make it possible to better communicate the summaries on the networks. Finally, the use of abstracts in foreign languages improves the recognition of our company by the international scientific community and thus facilitates the participation of foreign personalities in our work. Indeed, the academy sometimes hosts foreign speakers or symposia in foreign languages such as the colloquium on equine reproduction organized with the predominantly Anglo-Saxon IETS (International Embryo Technology Society) or the intervention of Dr. Alison van Eenennaam on Gene Editing in production animals ...



Conference in English by Dr. Alison van Eenennaam from UC Davis (USA) on 19 March 2019.

3. The key elements: translated summaries and keywords

Each medium or publication must therefore include, thanks to the authors, translated summaries and key words in the three selected languages (French, English and Spanish). Any good electronic search engine then facilitates access to our work from each village. Any good electronic search engine then facilitates access to our work from each village, each university, every residence or farm from all five continents. It is in everyone's best interests. Reciprocity is also true. Any member of the Academy, any scientist or French student must be able to have access to similar work issued by structures outside France, and other academies, via the languages mentioned. Some countries or international institutions, scientific or professional, have already imposed this approach for a long time and it is necessary to ensure that it is observed, always in the general interest. The UEAA (Union of European Academies for Science

Applied to Agriculture, Food and Nature) (see Chapter 1) must make this one of its priorities towards its own members, which will thus facilitate the dissemination of data.

In conclusion, better referencing of the work of the Academy would deserve the participation of each academician to improve their visibility and their referencing in the major international scientific information networks. The ‘International’ reflex must be reinforced in our activities, starting with a better use of at least English and Spanish ...

Summary: *An impressive amount of work is produced by the Academy and its members during sessions, working groups, academic notes, opinions, personal reflections. It requires communication beyond our borders. Each medium or publication must therefore include acknowledgement of the authors, translated abstracts and keywords in the three selected languages French, English and Spanish.*

Chapter 5

International AAF sessions: a great experience to renew

Guillaume Benoit, Member of the Academy, Section 10

The AAF's international working group decided to close its three-year programme by organizing an international session on 18 November 2020, giving the floor to speakers from other countries, foreign and non-foreign associate members of our Academy. It followed a similar session in 2019 on the theme: 'The international opening of AAF: Multicontinental Illustration'.

The theme chosen by the international group for this 2020 session, the second of its kind within the AAF, was 'Carbon, land, water and sustainable agricultural transition: what options, what visions, from North to South?'.

The world's agriculture faces a whole canvas of global and interconnected challenges: ensuring the food security of an ever-growing global population while preserving natural resources and the environment, adapting to climate change, making a full contribution to the fight against climate drift and the post-oil green economy. This said, the situations, vulnerabilities, development needs and types and possible scope of the different options to be mobilized differ significantly from one large region to another.

1. Critical interactions between food security and the environment

The need to better link issues of climate change, food security, carbon, soil, water and agricultural transition, both in reflection and action, has been highlighted on the international stage by the latest IPCC reports and at COP 21 and 22. After the successful launch of the '4 per 1000: Soils for Food Security and Climate' initiative by France in 2015 in Paris, Morocco followed in 2016 in Marrakech with the AAA initiative 'Adaptation of African Agriculture' focusing on four priorities -- water, soils, risk management and financing.

While the '4/1000' has positioned green carbon, soils and agriculture as a key factor in solving the climate problem, the 'AAA' has come to reflect how Africa, faced with the full force of the climate threat, strong population growth and an ever-increasing dependence on food imports, was now the continent of all the challenges. In this context, it would seem most interesting to organize a session that questioned some visions and options for agricultural transition 'from north to south'.

2. Looking at the 'South'

The focus on the 'South' (here Africa) focused first on water and second on agricultural transition.

Mohamed Aït Kadi recalled that Morocco is facing an over-exploited water resource that is becoming ever scarcer with climate change. He pointed out that the country had managed to decouple the growth of its agricultural GDP from rainfall thanks to the 'Plan Maroc Vert' and to a massive transition to localized irrigation (900,000 ha). However, it could do even more if it adopted large-scale agriculture combining soil conservation with direct seeding. In fact, Morocco's INRA is seeing gains of 3 to 14% in organic matter, 30 to 40% in yields and 60% in terms of water efficiency, at the same time as a reduction of 70% in energy expenditure.

As for Rattan Lal, he proposed as a vision of eco-intensification for Africa by 2050 to increase soil-regenerating conservation agriculture from 1.5 to 50 million ha, agroforestry (% of trees in cropland) from 10 to 20%, irrigation rate of 6 to 20% (Africa south of the Sahara is rich in water but Africans still lack it) and fertilizer consumption of 16 to 60 kg/ha (current global average 126 kg/ha). Such a well-conducted transition would restore the continent's ability to sustainably feed its populations, while capturing and sequestering a very large amount of carbon, and putting an end to deforestation and carbon destocking and associated biodiversity losses.

3. Looking at a Northern Region: Canada

From Denis Angers' presentation (Quebec), I personally retained the following: The additional carbon storage resulting from the elimination of bare fallow and ploughing (80% of the lands of the Great Canadian Plains concerned), now essentially achieved, confirms the possibility of cumulative carbon sequestration without destocking. Doing more will be possible through the use of cover crops and windbreak hedges, whose development will be encouraged by longer vegetative growth resulting from climate change.

4. What can be learned from the experience conducted in French-speaking Switzerland?

The presentation of Pascal Boivin (Switzerland) provided us with the following very interesting information: In the cantons of Geneva and Vaux, the average annual rate of accumulation of organic carbon in soils, after having long declined, has increased significantly over the past twenty years. By 2020, the average gain may have reached and exceeded + 10/1000, with pioneering farms achieving + 40/1000. The margins of progress still possible in a few decades from here are considerable (>70%): the average organic matter/clay rate, 10% in the canton of Geneva, is still far from the objective of good agronomic soils (17%). This example shows the strategic importance of regenerative soil conservation agriculture, high-diversity, biomass and frequency plant cover, and the cessation of all tillage. He advocates for follow-up and agronomy 'on the ground' for innovation and for the transition to aid for results. The canton of Geneva subsequently made the development of the ACS one of the flagship measures of its 'climate plan'.

We stayed with a Swiss perspective to draw some conclusions from this fascinating debate, that of Gérard Viatte, associate member of Section 10. We welcome this session which showed us how desirable it was to better link the issues, to think both "global" and "systems" and to act locally by giving ourselves eco-intensity ambitions adapted to each territorial context. And we will warmly thank all the speakers for their excellent presentations.

In conclusion, this second session organized by the Academy's working group on international relations demonstrated the richness of this approach. It provided an opportunity to compare observations in different latitudes, providing very relevant additional information, thus providing an excellent awareness of this global problem. It was above all a session of cross-examinations that invites optimism and exchange and not fear of the future and withdrawal.

In the end, these sessions -- open to the outside world and inviting as speakers international experts on a given topic -- are an excellent illustration of the international vocation of our Company, a historical achievement that should now be well valued. The group recommends that such sessions be held annually.

Summary: *The intention of the group was to organize annually a session highlighting the involvement of our company in international relations, with speakers from several foreign countries. The theme chosen for this 2020 Visio session, the second of its kind within the AAF, was 'Carbon, Land, Water and Sustainable Agricultural Transition: What Options and Visions,*

North to South?'. The speakers were from Morocco, USA, Canada and Switzerland. It gave an opportunity to compare observations from different latitudes, providing additional information that is entirely relevant, thus constituting an excellent awareness of this global problem. It was above all a session of converging views that invites optimism and exchange, with no fear of the future and no turning inward.



In 2019, session organized by the International Working Group: ‘The international opening of the French Academy of Agriculture: multi-continental illustrations’

ANNEX 1

Members of the Working Group on International Relations (2018-2020)

| | |
|---------------------------|------------|
| Guillaume Benoit, | Section 10 |
| Bernard Bourget, | Section 10 |
| Guilhem Bourri , | Section 5 |
| Jean Marc Boussard, | Section 4 |
| Jacques Brulhet, | Section 3 |
| Wolfgang Cramer, | Section 7 |
| Xavier D glise, | Section 2 |
| Marie de Lattre-Gasquet, | Section 10 |
| Fran ois Desprez, | Section 1 |
| Pierre Del Porto, | Section 3 |
| Guy Fradin, | Section 7 |
| Jean Jacques Herve, | Section 1 |
| Andreas Kleinschmit, | Section 2 |
| Brigitte Laqui ze, | Section 4 |
| Florent Maraux, | Section 5 |
| Fr d ric Marion-Poll, | Section 6 |
| Catherine Regnault-Roger, | Section 1 |
| Agn s Ricroch, | Section 6 |
| Patrice Robichon, | Section 8 |
| Bernard Roux, | Section 10 |
| Henri Rouill  d'Orfeuil, | Section 4 |
| Michel Thibier, | Section 3 |
| Andr e Voilley, | Section 8 |