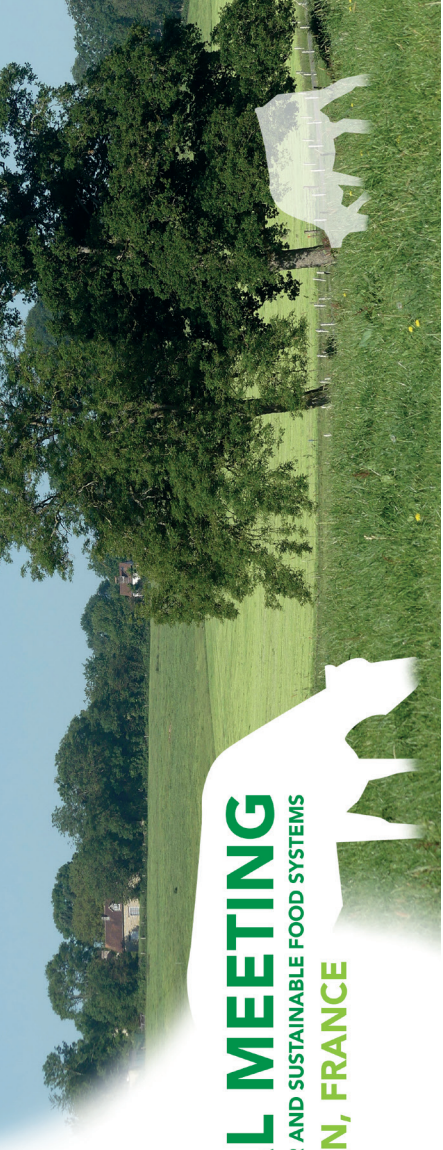

EGF 2022 CAEN FRANCE
European Grassland Federation

29th GENERAL MEETING
GRASSLAND AT THE HEART OF CIRCULAR AND SUSTAINABLE FOOD SYSTEMS
JUNE 26-30, 2022 • CAEN, FRANCE

EGF

Conference Guide

Grassland at the heart of circular and sustainable food systems

26 - 30 June 2022
Caen . France

INRAE

RÉPUBLIQUE FRANÇAISE
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AFPF

Foreword

We would like to welcome all delegates of the European Grassland Federation 29th General Meeting to Caen, France. The previous EGF meeting held in France took place in La Rochelle in 2002. During these last two decades, food systems have been increasingly challenged for their impacts on climate change, loss of biodiversity and other environmental issues while at the same time the question of food security in Europe is being raised with the successive health and political crises. Therefore the main theme of the EGF 2022 General Meeting is "Grassland at the heart of circular and sustainable food systems". The 29th general EGF meeting will consider the contributions of grasslands to the development of circular, healthy and sustainable food systems. Grasslands are widely acknowledged for their role in preserving natural resources and biodiversity and soil Carbon sequestration but at the same time ruminants, which are the main managers of grassland for food production, are blamed for their emissions of methane and their inefficient use of resources. As the expectations regarding food systems are multi-faceted and because the importance of each service provided by grasslands varies according to the stakeholder's visions, local context and farming practices, achieving the objectives requires the search for new compromises. The analysis of the relationship between services, their drivers encompassing economic, social, biological and biotic regulatory processes and the search for compromises and synergies will be the keystone of this meeting.

The meeting has five themes: (1) Putting grasslands into perspectives; (2) Highlighting the bundles of services provided by grasslands; (3) Using biodiversity to reduce vulnerability and increase resilience of grassland based systems; (4) Looking for synergy between animal, grasslands and crops; (5) Illustration of initiatives for the transfer and co-construction of innovations on and for grassland.

There are five mid-conference tours organised in Normandy to discover the high value habitats and attractive landscape of wet grasslands, the dairy and beef production from grassland based systems and the diversity of animal-based products derived from grassland in addition to a visit to a horse farm as Normandy

is the primary French region for horse breeding. The post conference tour will visit Omaha beach and an impressive American cemetery, the Mont St Michel bay with an amazing crossing of the bay by foot, sheep flocks grazing on salt grassland and a visit of the old city of Rennes.

The General Meeting is organised by INRAE and the University of Caen Normandy. They develop a wide range of research projects including ecology, plant and animal science, environmental and social sustainability, grassland and grazing management, system analysis and whole value chain perspectives.

We would like to thank all authors for their contributions, numerous reviewers for their valuable remarks which have helped to ensure the high quality of the papers presented, the members of the scientific and organising committees, the organisations and stakeholders involved in the mid conference tours, the secretary of EGF, and our sponsors and all delegates attending the conference.

We wish that the 29th General Meeting of EGF will provide novel insights for grassland science and stimulate fruitful discussions and networking and all participants will have enjoyable days in Normandy.

Dr Jean-Louis Peyraud	Luc Delaby	Marie-Pascale Prud'homme
President, European Grassland Federation	Chair Scientific Committee	Secretary Organizing committee

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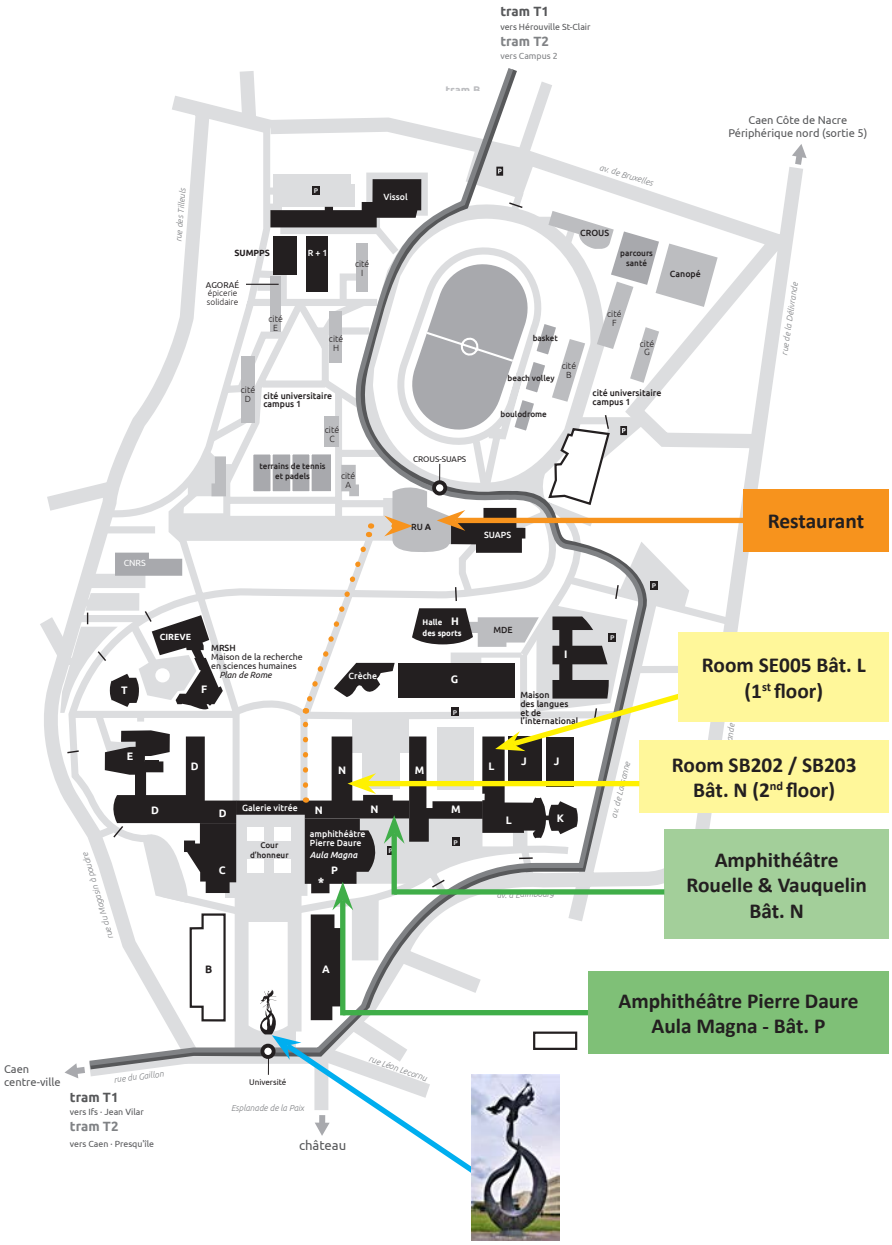
Sponsors and supporters

The organizing committee is grateful to the following sponsors for their appreciated support of the EGF 2022 general meeting.

Location map of Caen University



Organisation of the EGF 2022

Organising Committee

President: Jean-Louis Peyraud- INRAE
General secretary: Marie-Pascale Prud'homme- Université Caen Normandie
Émilie Bernard- INRAE
Marion Cressent- IFCE · Institut Français du Cheval et de l'Équitation
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Annette Morvan-Bertrand- Université Caen Normandie
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Maxime Marie- Université Caen Normandie
Jean-Louis Peyraud - INRAE
Sylvain Plantureux - Université de Lorraine
Marie-Pascale Prud'homme - Université Caen Normandie
Françoise Vertès - INRAE

Mid-conference tour organisers

Tour 1: UniCaen- Université Caen Normandie / PNRMCB – Parc Naturel Régional des Marais du Cotentin et du Bessin

Tour 2: Idele- Institut de l'Élevage

Tour 3 and 4: Littoral Normand

Tour 5: IFCE- Institut Français du Cheval et de l'Équitation

Final appointment: INRAE Experimental farm of Le Pin and Le Haras national du Pin

EGF 2022 Conference Schedule

Sunday 26th June

09:30 / 17:00 Working group "Grazing" meeting
17:00 / 19:30 Registration at the conference venue

Monday 27th June

08:00 / 09:30 Registration at the conference venue
09:00 / 10:00 Opening ceremony
10:00 / 10:30 Coffee break / Posters setting up
10:30 / 11:30 Session 1- Plenary papers
11:30 / 12:30 Panel discussion
12:30 / 13:30 Lunch
13:30 / 14:30 Coffee break / Poster session
14:30 / 16:00 Session 2- Plenary papers
16:00 / 17:00 Coffee Break / Poster session
17:00 / 18:30 Parallel theatre presentations
18:30 / 20:00 Welcome reception in The Aula Magna hall

For those interested, the business meeting of EGF will be held between 16:00 to 18:30 in the dedicated meeting room SE005 (see on the UniCaen map).

Tuesday 28th June

08:45 / 16:00 Mid conference tours
16:30 / 18:30 Visit of the INRAE experimental farm and Le Haras national du Pin
18:30 / 19:30 Equestrian show in the royal courtyard of Le Haras national du Pin
20:00 / 23:00 Gourmet dinner
00:00 / 00:30 Arrival to Caen

Wednesday 29th June

09:00 / 10:00	Session 3- Plenary papers
10:00 / 10:30	Coffee break
10:30 / 12:30	Parallel theatre presentations
12:30 / 13:30	Lunch
13:30 / 14:00	Coffee break / Poster session
14:00 / 14:30	Session 4- Plenary paper
14:30 / 16:00	Parallel theatre presentations
16:00 / 17:00	Coffee Break / Poster session
17:00 / 18:00	Parallel theatre presentations
18:15 & 19:00	Departures to the WIP by bus
19:30 / 23:00	Conference dinner
23:00 & 00:00	Back to Caen by bus

Thursday 30th June

09:00 / 10:00	Session 5- Plenary papers
10:00 / 10:30	Coffee break
10:30 / 11:00	Testimony presentations
11:00 / 11:30	Closing session: Synthesis of the conference
11:30 / 12:00	EGF Business meeting / Closing ceremony
12:30 / 13:30	Lunch
14:00	Departure of the Post conference tour

EGF 2022 Scientific programme

Monday 27th June

08:00 / 09:30 Registration at the conference venue

09:00 / 10:00 **Opening ceremony**
Location: Amphitheater Pierre Daure
Lamri Adoui, President of Caen University
Philippe Mauguin, President of INRAE
Wolfgang Burtscher, Director-General, DG Agriculture and Rural Development, European Commission
Jean Louis Peyraud, President of the EGF 2022 Organising Committee

10:00 / 10:30 Coffee break / Posters setting up

10:30 / 11:30 **Session 1 - Putting grassland into perspective**
Plenary papers
Location: Amphitheater Pierre Daure
Chair by J.-L. Peyraud

1.1 - Why and how to support the supply of non-provisional ecosystem services by European grasslands through the Common Agricultural Policy?
H. Guyomard, T. Pinto-Coreira and J. Rouet-Leduc

1.2 - Permanent grassland and ruminants are a key component of the agroecological transition in Europe – findings from "Ten Years For Agroecology" scenario
X. Poux and P.-M. Aubert

11:30 / 12:30 Panel discussion, with the participation of
Wolfgang Burtscher: DG Agriculture and Rural Development, EU
Dionys Forster: Sustainable Agriculture Initiative Platform,

Switzerland
Brendan Golden: Irish farmer, Vice-Chair of the Working Party on Beef, Ireland
Hervé Guyomard: INRAE, France
Alain Peeters: WWF, Belgium

12:30 / 13:30 Lunch

13:30 / 14:30 Coffee break / Poster session

14:30 / 16:00 **Session 2 - Bundles of services provided by grasslands**
Plenary papers
Location: Amphitheater Pierre Daure
Chair by J. Isselstein

2.1 - Ecosystem services provided by semi-natural and improved grasslands – synergies, trade-offs and bundles
R. Lindborg, A. Bernués, T. Hartel, A. Helm and R. Ripoll Bosch

2.2 - Multifunctionality and diversity of livestock grazing systems for sustainable food systems throughout the world: What can we learn for Europe?
A. Ickowicz, B. Hubert, M. Blanchard and coll.

2.3 - Coupling the benefits of grassland crops and green biorefining to produce protein, products and services for the green transition
U. Jørgensen, S.K. Jensen and M. Ambye-Jensen

16:00 / 17:00 Coffee Break / Poster session

17:00 / 18:30 **Parallel theatre presentations #1**

1. Theme 1 & 5
Location: Amphitheater Rouelle

Chair by A. Van den Pol-van Dasselaar and J. Rankin

2. Theme 2 & 3
Location: Amphitheater Pierre Daure
Chair by V. Klauss and C. Palmborg

3. Theme 4
Location: Amphitheater Vauquelin
Chair by G. Fleurance and C. Resch Zafra

18:30 / 20:00 Welcome reception in The Aula Magna hall

Tuesday 28th June

08:45 / 16:00 **Mid conference tours**

1. Biodiversity in Cotentin marshes
2. Organic dairy system in the Ornais bocage
3. Dairy system in the Pays d'Auge and PDO products
4. Beef and beef from dairy in Normandy
5. Normandy, land of horse breeding

16:00 / 18:30 Visit of the INRAE experimental Unit and Le Haras national du Pin

18:30 / 19:30 Equestrian show in the royal courtyard of Le Haras national du Pin

20:00 / 23:00 Gourmet dinner

Wednesday 29th June

09:00 / 10:00 **Session 3 - Using biodiversity to reduce vulnerability and increase resilience of grassland based systems**
Plenary papers
Location: Amphitheater Pierre Daure
Chair by C. Picon-Cochard

3.1 - Using plant diversity to reduce vulnerability and increase drought resilience of permanent and sown productive grasslands
A. Lüscher, K. Barkaoui, J. A. Finn and coll.

3.2 - Diversification increases the resilience of European grassland-based systems but is not a one-size-fits-all strategy
B. Dumont, A. Franca, F. López-i-Gelats and coll.

10:00 / 10:30 Coffee break

10:30 / 12:30 **Parallel theatre presentations #2**

1. Theme 2
Location: Amphitheater Vauquelin
Chair by K. Klumpp and U. Jørgensen

2. Theme 3
Location: Amphitheater Rouelle
Chair by B. Tonn and G. Peratoner

3. Theme 4
Location: Amphitheater Pierre Daure
Chair by M. O'Donovan and V. Lind

12:30 / 13:30 Lunch

13:30 / 14:00 Coffee break / Poster session

14:00 / 14:30 **Session 4 - Looking for synergy between animal production, grasslands and crops**
Plenary paper
Location: Amphitheater Pierre Daure
Chair by D. Hennessy

4.1 - Reconnecting cropping and livestock operations to enhance circularity and avoid ecological collapse
A.J. Franzluebbers and G. Martin

14:30 / 16:00 **Parallel theatre presentations #3**

1. Theme 2
Location: Amphitheater Vauquelin
Chair by M. Rinne and P. Goliński

2. Theme 3
Location: Amphitheater Rouelle
Chair by J.A. Finn and M.R. Mosquera-Losada

3. Theme 4
Location: Amphithaeter Pierre Daure
Chair by V. Brocard and I. Dufrasne

16:00 / 17:00 Coffee break / Poster session

17:00 / 18:00 **Parallel theatre presentations #3 (suite)**

1. Theme 2
Location: Amphitheater Vauquelin
Chair by M. Rinne and P. Goliński

2. Theme 3
Location: Amphitheater Rouelle
Chair by J.A. Finn and M.R. Mosquera-Losada

3. Theme 4
Location: Amphitheater Pierre Daure
Chair by V. Brocard and I. Dufrasne

19:30 / 23:30 Conference dinner at the WIP, the place to be

Thursday 30th June

09:00 / 10:00 **Session 5 - Initiatives for the transfer and co-construction of innovations on and for grassland**
Plenary papers
Location: Amphitheater Pierre Daure
Chair by A. Krause

5.1 - EIP-AGRI: EU initiatives for the transfer and co-creation of innovations on and for grassland
R. Schreuder, G. Peratoner, P. Goliński and coll.

5.2 - An overview of European permanent grasslands: SUPER-G proposals to improve their sustainability and multifunctionality
J.P. Newell Price, C. Bufe, L. Frewer and coll.

10:00 / 10:30 Coffee break

10:30 / 11:00 Testimonies presentations of innovation and transfer knowledge
Location: Amphitheater Pierre Daure
Chair by A. Krause and V. Brocard

11:00 / 11:30 **Closing session: Synthesis of the conference**

11:30 / 12:30 EGF Business meeting / Closing ceremony

12:30 / 13:30 Lunch

14:00 Departure of the Post conference tour

List of theatre presentations

Parallel theatre presentations #1 - Monday, 27 / 17:00 - 18:30

- **Theme 1 & 5 - Amphitheater Rouelle**

Are we talking about the same thing? Stakeholder perspectives on grassland management intensity
Tonn B., Ten Berge H., Bufe C., Buchmann N., Eggers S., Fernández Rebollo P., Klaus V.H., Lellei-Kovács E., Lombardi G., Ravetto Enri S., Stypinski P. and Newell Price J.P.

Citizen and consumer attitudes to grassland landscapes in Europe
Tindale S., Ojo M., Gallardo-Cobos R., Hunter E., Miškolci S., Vicario-Modroño V., NewellPrice P., Sánchez-Zamora P., Sonnevelt M. and Frewer L.J.

The influence of circular agriculture on the financial performance of dairy farms in the Netherlands
Van de Geest W., Verhoeven F., Dirksen H., Ankersmit E. and Van den Pol-van Dasselaar A.

Sustainable management model for the preservation of valuable open mountain areas: the Open2preserve project
Múgica L., Canals R.M., San Emeterio L., Mosquera-Losada M.R., Torres F., Plaixats J., Castro M., Robles A.B., Sáez J.L., Aguerre C., Duperron C. and Yebra R.

Developing sustainable management of Alpine and pre-Alpine grasslands – from research to practice
Schneider K., Schucknecht A., Krämer A., Dannenmann M., Wiesmeier M., Köllner T., Jentsch A., Schloter M., Kögel-Knabner I. and Kiese R.

CarSolEl, a user-friendly tool to predict carbon stocks evolution in grassland-based farms
Brun-Lafleur L., Graux A.I, Klumpp K., Martin R., Thérond O., Vertès F. and Chambaut H.

• **Theme 2 & 3 - Amphitheater Pierre Daure**

Holistic environmental assessment of high nature value farming systems in Europe
Torres-Miralles M., Kyttä V., Jeanneret P., Lamminen M., Manzano P., Tuomisto H.L. and Herzon I.

A systematic review of threats in permanent grassland cultural ecosystem services
Pellaton R., Báldi A. and Lellei-Kovács E.

How professional stakeholders perceive the current and future relevance of grassland ecosystem services in Switzerland
Klaus V.H., Richter F., Reichmuth C., Jan P., El Benni N., Buchmann N. and Lüscher A.

Taxonomic and functional biodiversity positively influence agronomic characteristics of permanent grassland
Mesbahi G., Poutaraud A., Bayeur C. and Plantureux S.

Adaption of selected grasses towards micro-environmental conditions under long-term extensive grazing
Komainda M., Titěra J., Tonn B., Kajzrová K., Pavlů V.V. and Isselstein J.

Joint effects of biocontrol herbivory and plant competition greatly reduce the growth of *Rumex obtusifolius*
Klötzli J., Suter M., Schaffner U., Müller-Schärer H. and Lüscher A.

• **Theme 4 - Amphitheater Vauquelin**

Productivity and nitrogen flows for grass systems targeting future biorefineries: a 5-year study in Denmark
Zhang S., Lærke P.E., Jørgensen U. and Manevski K.

Drone-based multispectral imagery is effective for determining forage availability in arid savannas
Amputu V., Tielboerger K. and Knox N.

Forage quality predicted by hyperspectral reflection measurements across climate zones
Männer F.A., Dubovyk O., Ferner J., Freyaldenhoven A., Muro J., Schmidtlein S. and Linstädter A.

Effects of electrical impulses on cattle grazing behaviour: virtual vs physical fencing
Hamidi D., Komainda M., Grinnell N.A., Horn J., Riesch F., Ammer S., Hamidi M., Traulsen I. and Isselstein J.

Grazing farms differentiation through the expression of microARNs and AI algorithm
Abou el qassim L., Alonso J., Royo L.J. and Díez J.

Deployment of models to predict compressed sward height at a large scale: results and feedback
Nickmilder C., Tedde A., Dufrasne I., Lessire F., Tychon B., Curnel Y., Bindelle J. and Soyeurt H.

Parallel theatre presentations #2 - Wednesday, 29 / 10:30 - 12:30

- **Theme 2 - Amphitheater Vauquelin**

Modelling studies of beef and dairy farming in boreal environments: a review
Forster D., Helama S., Virkajärvi P. and Shurpali N.J.

Extending grassland age for climate change mitigation and adaptation on clay soils
Iepema G.L., Hoekstra N., de Goede R., Bloem J., Brussaard L. and van Eekeren N.

Fate of recently fixed C in plant-soil monoliths from permanent grasslands
Cliquet J.B., Roussel C., Lemauviel-Lavenant S. and Morvan-Bertrand A.

Fertilization of grass-clover leys with mineral N and slurry: effect on clover dynamics, N_2-fixation and nitrate leaching
Fontaine D., Rasmussen J. and Eriksen J.

Delivery of ecosystem services from permanent grasslands in Europe: a systematic review
Schils R.L.M., Bufe C., Rhymer C.M., Francksen R.M., Klaus V.H., Abdalla M., Milazzo F., Lellei-Kovács E., Ten Berge H., Bertora C., Chodkiewicz A., Dămătîrcă C., Feigenwinter I., Fernández-Rebollo P., Ghiasi S., Hejduk S., Hiron M., Janicka M., Pellaton R., Smith K.E., Thorman R., Vanwalleghem T., Williams J., Zavattaro L., Kampen J., Derkx R., Smith P., Whittingham M.J., Buchmann N. and Newell Price J.P.

Ecosystem services of pre-Alpine grasslands – the effects of climate change and management
Schucknecht A., Schneider K., Gasche R., Petersen K., Wolf B. and Kiese R.

Trade-offs between services rendered by semi-natural grasslands of the Vosges massif (France)
Plantureux S., Mesbahi G. and Bayeur C.

Mechanical loosening of grasslands – a risk to ecosystem services or a restorative practice?
Newell Price J.P., Hadden S., Rhymer C., Francksen R., Standen J., Thorman R., Dowers J., Whittingham M. and Williams J.

- **Theme 3 – Amphitheater Rouelle**

Biodiversity assessed through different metrics to evaluate grassland ecosystem services in Massif Central
Allart L., Joly F., Mosnier C., Dumont B. and Gross N.

Impact of drought stress and climate change on yield and forage quality of grassland
Schaumberger A., Klingler A. and Herndl M.

Assessment of grassland sensitivity to drought in the Massif Central region using remote sensing
Luna D., Pottier J. and Picon-Cochard C.

A multicriteria method to evaluate the resilience of grass-based dairy farms to climate change in Brittany
Geffroy K., Auberger J., Busnot S., Carof M., Jacquot A.L., Novak S., Parnaudeau V., Puech T., Vertès F., Viaud V., Wilfart A. and Godinot O.

Overyielding in multi-species swards under simulated grazing management
Patterson J.D., Herron E.R., Mocarska M., Gordon A.W. and Young G.K.

Dry matter production of multispecies swards at three nitrogen application rates under dairy grazing
Hearn C., Egan M., Lynch M.B. and O'Donovan M.

Multispecies grass-legume swards productivity and reducing nitrogen fertilization
Šidlauskaitė G., Šarūnaitė L. and Kadžiulienė Ž.

Multispecies swards exceed the productivity of perennial ryegrass monocultures under a beef rotational grazing system
Baker S., Lynch M.B., Godwin F., Kelly A., Boland T.M., Evans A.C.O., Murphy P.N.C. and Sheridan H.

- **Theme 4 – Amphitheater Pierre Daure**

A review of beef and sheep grazing management suitable for hill and upland environments
Rutherford N.H., Aubry A.E. and Lowe D.E.

Co-grazing horses and cattle requires appropriate management to provide its expected benefits
Fleurance G., Sallé G., Lansade L., Wimel L. and Dumont B.

Adaptation of fresh lactating dairy cows to grazing
Rivoir C., Adrien L., Mattiauda D.A., Klaus R., Menegazzi G. and Chilibroste P.

Effect of sward type on in-vivo dry matter intake, digestibility and methane output in sheep
Woodmartin S., Creighton P., Boland T.M., Farrell L. and McGovern F.

The effect of the addition of a companion forage to a perennial ryegrass sward on lamb performance
McGrane L., Boland T.M., Monaghan A. and Creighton P.

Bacterial and botanical diversity of the pasture influence the raw milk cheese sensory properties
Manzocchi E., Martin B., Bord C., Bouchon M., Bérard J., Coppa M., Delbès C. and Verdier-Metz I.

Milk production and quality from grass-only, PMR and TMR feeding systems
Fitzpatrick E., Gilliland T.J., Patton J. and Hennessy D.

Faba bean silage as a substitute for grass silage in dairy cow diets
Halmemies-Beauchet-Filleau A., Kuoppala K., Kokkonen T. and Vanhatalo A.

Parallel theatre presentations #3 - Wednesday, 29 / 14:30 - 16:00 and 17:00 - 18:00

- **Theme 2 - Amphitheater Vauquelin**

Robust cattle valorise ecosystem services of marginal grassland
Pauler C.M. and Schneider M.K.

Provisioning ecosystem services of fertilized meadows and pastures differ in their response to organic management
Richter F., Lüscher A., El Benni N., Jan P., Buchmann N. and Klaus V.H.

Extensively managed grasslands: productivity after more than a decade without fertilizer input
Grinnell N.A., Komainda M., Tonn B., Hamidi D. and Isselstein J.

Effects of management factors and additive treatments on grass silage quality
Franco M., Huuskonen A., Manni K. and Rinne M.

The repeatability of perennial ryegrass grazing efficiency as measured by Residual Grazed Height
Tubritt T., Delaby L. and O'Donovan M.

Stress caused by extreme weather conditions reflects on the nutritive value of grass
Järvenranta K., Niemeläinen O., Mustonen A., Nikama J. and Virkajärvi P.

Prediction of water-soluble carbohydrate contents in hay from their content in fresh forage and drying time
Deroche B., Morvan-Bertrand A., Le Morvan A., Wyss U., Aoun M. and Baumont R.

Scaling-up innovative grass-based products and services
Orozco R., Mosquera R., Rodriguez J., Adamseged M.E. and Grundmann P.

Legume biomasses produce high protein yields in a green biorefinery concept
Rinne M., Franco M., Stefański T., Ghalibah M., Fidelis M., Järvenpää E. and Pap N.

Mineral concentration in fractions of green forages after screw-pressing
Hansen N.P., Damborg V.K., Stødkilde L., Weisbjerg M.R. and Jensen S.K.

- **Theme 3 - Amphitheater Rouelle**

Crop rotation effect on red clover persistence in mixed grass-clover leys
Bergqvist S., Bergkvist G., Forkman J., Parsons D. and Nilsdotter-Linde N.

Grass-clover leys for a sustainable N yield: *Trifolium pratense* cultivar × mixture effects
Gamper H.A., Mairhofer F., Ceccon C., Matteazzi A., Gauly M. and Peratoner G.

Strong beneficial effects of grassland sward diversity on reducing nitrous oxide emissions and emissions intensity
Cummins S., Finn J.A., Richards K.G., Lanigan G.J., Grange G., Brophy C., Cardenas L.M., Misselbrook T.H., Reynolds C.K. and Krol D.J.

Response of different grass-based mixtures to weather conditions in the Netherlands
Ankersmit E., Van de Geest W., Ter Horst A.C. and Van den Pol-van Dasselaar A.

Coexistence of geese and grassland – new grassland mixtures tolerating geese grazing
Elverland E., Dalmannsdottir S., Tombre I. and Jørgensen M.

Diversity mitigates overwintering damage due to prolonged snow cover during ley establishment
Peratoner G., Mairhofer F., Rottensteiner A., Della Rosa L. and Mittermair P.

Strengthening the resilience of grasslands against the unpalatable C4 grass *Setaria pumila*
Huguenin-Elie O., Schmid H., Odermatt M., Stutz C.J., Gago R. and Lüscher A.

Overseeding and rehabilitation of degraded upland grasslands after *Arvicola terrestris* outbreaks
Bouchon M., Louault F., Vassal N., Michelin Y., Pomiès D. and Bloor J.M.G.

Flora biodiversity in silvopastoral systems under *Pinus radiata* D. Don in Galicia (NW Spain)
Ferreiro-Domínguez N., Rigueiro-Rodríguez A. and Mosquera-Losada M.R.

AEOLE – a collaborative initiative which benefits both farmers and biodiversity
Carrère P., Borres J.B. and Galliot J.N.

- **Theme 4 – Amphitheater Pierre Daure**

Legacy effects in a grassland-crop rotation enhanced by legume content
Grange G., Brophy C. and Finn J.A.

Grazing by red deer counteracts atmospheric nutrient deposition in semi-natural open habitats
Riesch F., Wichelhaus A., Tonn B., Meißner M., Rosenthal G. and Isselstein J.

The different services provided by grasslands in livestock-crop reconnection
Maillet G., Angevin F., Ramonteu S. and Baumont R.

Evaluating GHG emissions and profitability of innovative grassland-based farming systems on a Dutch peat meadow
Moreira T., Derks M., Janssen A., Loman P. and Veenland W.

Efficiency of cows' diets in Galician dairy farms under the feed-food competition perspective
Botana A., Lorenzana R., Pereira-Crespo S., García-Souto V., González L., Veiga M., Martínez-Diz M.P., Dagnac T., Valladares J., Resch-Zafra C. and Flores-Calvete G.

Agroforestry reduces nitrogen surplus of organic poultry and pig production
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142. Satellite-based estimation of herbage mass: comparison with destructive measurements and UAV model's estimation
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143. Combination of cattle slurry and mineral N fertilizer for efficient grass production in Finland
Termonen M., Kykkänen S., Korhonen P., Mustonen A., Seppänen M. and Virkajärvi P.

144. Technical, economic and environmental performances of two contrasting dairy systems
Tranvoiz E., Brocard V., Dupre S., Foray S., Le Coeur P., Raison M., Trou G. and Follet D.

145. Creating and utilizing a DNA reference library for faecal DNA metabarcding to determine diet composition of herbivores
Vallin H.E., Fraser M.D. and Hipperson H.

146. Pasture type effect on fatty acids and fat-soluble antioxidants profile in grazing cows' dairy milk
Veiga M., Resch-Zafra C., González L., García-Souto V., Pereira-Crespo S., Botana A., Martínez-Diz M.P., Valladares J., Dagnac T., Lorenzana R. and Flores-Calvete G.

147. Biochar decreases the ammonia emissions of cattle slurry
Vicente F., Baizán S., Menéndez M. and Martínez-Fernández A.

148. Impact of autumn closing date and spring defoliation date on herbage production and clover content
Walsh S., McKay Z.C. and Egan M.

149. The effect of spring grass availability on milk production in early lactation
Walsh S., McKay Z.C. and Egan M.

• Theme 5 - Initiatives for the transfer and co-construction of innovations on and for grassland

150. Utilizing unsupervised learning to improve sward content prediction and herbage mass estimation
Albert P., Saadeldin M., Narayanan B., Mac Namee B., O'Connor N., Hennessy D., O'Connor A.H. and McGuinness K.

151. Near infrared reflectance spectroscopy analysis of multi species swards in Northern Ireland
Archer J.E., Warrington I.R., Grant N.R. and Patterson J.D.

152. Using participatory research approaches to favour grazing practices of large herds of dairy cows
Bitu C., Leroux M., Piovan R., Delaby L., Launay F., Aubé L. and Guyomard H.

153. Ten years of mobile milking at experimental farm Trévarez in France
Cloet E., Brocard V., Guiocheau S. and Le Cœur P.

154. How do farmers define the health of their grassland?
Cremilleux M., Quandalle M., Martin B. and Michaud A.

155. Adapting a Northern Ireland grass growth model to produce 14-day regional forecasts across the UK
Huson K.M., Laidlaw S., Takahashi T. and McConnell D.A.

156. Combination of grassland surveys and knowledge transfer in the SatGrass project
Klingler A., Schaumberger A., Adelwöhrer M., Graiss W., Gaier L. and Krautzer B.

157. HappyGrass, a unique set of applications to manage grazing and meadows from sowing to harvest
Leborgne A., Gaudillière N., Delaby L., Pavie J. and Pierre P.

158. Pre-estimation of silage density via an application by using data available on farm
Milimonka A., Glenz G. and Hilgers B.

159. Drone RGB imaging for phenotyping of red clover stand density in field experiments
Morel J., Bergqvist S., Parsons D., Öhlund L. and Aryal J.

160. PastureBase Ireland - the adoption of grassland knowledge on Irish grassland farms
O'Donovan M., Elodie R. and O'Leary M.

161. Monitoring warming of silage with IoT-based tool may help to predict-silage quality
Pölönen I., Koskela O., Hattingh G., Laine R., Kulku J., Suokannas A. and Palander S.

162. Farmer led innovation in the use of multi-species swards on Northern Ireland farms
Rankin J.R., Hoy J., Brown S., Lowe D.E., Patterson J.D., Scollan N.D. and Lively F.O.

163. Grass growth prediction in Ireland to improve grazing management practice
Ruelle E., O'Leary M., Hennessy D., Bonnard L., Delaby L. and O'Donovan M.

164. Communicating knowledge on grassland management using videos and the internet
Schneider M.K., Pauler C.M., Alföldi T., Willems H., Werder C. and Mettler D.

165. Pasture evaluation program improves horse health and grassland management
Smith S.R. and Lea K.

166. Exemplary on-farm research of region-, period- and sward-specific grassland yield prediction using geoprocessing methods
Stumpe C., Mundt M. and Böttinger S.

167. The role of grasslands in PATHWAYS
Van den Pol-van Dasselaar A., Smith L.G., Oliveira D. and Blokhuis H.J.

The mid conference tours

Tour 1 – Biodiversity in the Cotentin marshes

The Cotentin marshes form an isthmus linking the peninsula from Cotentin to the mainland. They consist of a very attractive landscape with vast areas of wet grasslands which are flooded in winter and then, in spring, support a wide diversity of plants and animals, especially birds. Wet grasslands are recognized as valuable habitats, but they also provide many other ecological services. The bundle of services includes plant diversity, forage production and quality, and regulation services such as C storage.

Marshes constitute high value habitats for plants and animals and are particularly important breeding grounds for waders. The biodiversity of the marshes will be described, with a particular focus on ornithology. Water levels are one of the key factors of the territory and trade-offs are required to reconcile the expectations of stakeholders with environment objectives. Delegates will learn about water management which is achieved through hydraulic installations such as floating doors.

The Regional Natural Park of the Cotentin and Bessin Marshlands, responsible for the environmental protection in this area, will welcome delegates. The Park Managers will outline their mission and objectives in working with the livestock farmers in the area, and also with the many other stakeholders.

A farmer will describe his activities and how he manages his wetlands, and discuss the difficulties and the advantages of working on wetlands.

Tour 2 – Organic dairy systems in the Ornais bocage.

With almost 4% of total milk production, the share of organic milk is increasing in France. Normandy is one of the regions where the conversion to organic is increasing. Two farms will be visited as part of this tour, as well as a visit to a dairy processor accompanied by some cheese tasting which will conclude the tour.

Managing a 230 ha mixed crop-livestock system, the Guilbert brothers (GAEC Guilbert) chose to diversify their crops, their types of forages and their harvest methods in order to achieve near self-sufficiency on their farm. The 150 cows produce 800,000 litres of organic milk annually. Four work units are in operation on the farm which also includes an experimental platform, a drying shed and a biogas production unit.

Francois and Arnault Roullant manage a dairy farm (EARL du Bois d'Arry) with 140 dairy cows on a total agricultural area of 160 ha and 140 ha of grassland. Their production of organic milk is approximately 750,000 litres per year. The transition from a conventional forage system based on cereals and maize silage to organic production was made by maximising grass production and grazing. The design of their grazing area, the use of multi-species grasslands, the quality of the forage harvested and an effective grazing management plan are key ingredients to their success.

Fromagerie Gillot produces two PDO cheeses: Camembert and Pont L'Evêque. Fromagerie Gillot develops authentic, quality products that preserve the aromatic richness of raw milk. It contributes to the preservation of French gastronomic heritage in France and abroad.

This tour N° 3 visits the Pays d'Auge, a famous region in Normandy, a region of PDO cheeses. Through visiting two dairy farms, delegates will discover how farmers practice the PDO specifications on a daily basis. The first farm (GAEC du Manoir de Grandouet) has an organic farming system with different ways of using grassland including grazing, indoor feeding with fresh grass, outdoor dried hay and barn dried hay. The farm has 110 Normande and crossbreed cows, producing 500,000 kg of milk annually. The farm area is 148 ha, with 12 ha of maize grain and 136 ha of grasslands. The farm also has a high-stem apple orchard (25 ha) and produces apple juice, cider, and Pommeau and Calvados alcohol (also as PDO products).

The second farm (EARL de la Trabotière) is more common of Normandy with a forage system combining maize and grass silage in winter, grazing on limited access area in summer and a milking robot with two stalls. On this farm, 90 Normande cows graze on just 25 ha of sown grassland. The farm crops are mainly maize for silage (30 ha) and cereals as wheat (20 ha), barley (7 ha) and rapeseed (17 ha).

This tour will conclude with a visit to the dairy processor Fromagerie Graindorge and be accompanied by some cheese tasting.


Cherbourg-en-Cotentin
Valognes
Baie de la Seine
Parc naturel régional des Marais du Cotentin et du Bessin
Carentan
Bayeux
Ouistreham
Bolbec
Montivilliers
Le Havre
Honfleur
Trouville-sur-Mer
Pont-Audemer
Pont-l'Evêque
GAEC du Manoir de Grandouet
Lisieux
Saint-Lô
Fromagerie Graindorge
Bernay
Coutances
Saint-Pierre-sur-Dives
EARL de la Trabottière
Falaise
Granville
Vire
Domaine INRAE du Pin
Argentan
L'Aigle
Flers
Avranches
Mont-Saint-Michel
Malo

Tour 4 – Beef and beef from dairy in Normandy

Three beef producing farms will be visited on this tour. Stéphane and Franck Labarrière breed 120 Charolais suckler cows in the Dives marshes near Cabourg. The feed for the whole herd is based on grass grazed and harvested throughout the year. The production system allows access to local markets to sell meat produced on the farm.

Beef from dairy is one of the production systems on the second farm. Denys Lerévérend raises Normande breed dairy cows to produce PDO milk. While the heifers have a traditional outlet (replacement or in-calf sale), the males are raised as traditional grass-fed cattle. A few months ago, the Normande selection organisation signed a contract with a major French distributor to create an outlet with better meat value linked to the grass-fed system.

In the third farm, Stéphane and David Debons own 55 Blonde d'Aquitaine cows and 75 Holstein dairy cows. They farm 130 ha of crops and 88 ha of permanent grassland. Crops and livestock are complementary because forage (maize, fodder beet, alfalfa and wheat), straw and concentrates are produced to feed the cattle herd and obtain self-sufficiency, while the effluents are distributed over the crop areas. Some of the meat produced on the farm is sold directly from the farm in local and short distance markets.


Fécamp
Cherbourg-en-Cotentin
Bolbec
Montivilliers
Baie de la Seine
Le Havre
Valognes
Honfleur
Parc naturel régional des Marais du Cotentin et du Bessin
Trouville-sur-Mer
Pont-Audemer
Carentan
GAEC des Brouins
Bayeux
Pont-l'Evêque
Dozulé
Caen
Ifs
Lisieux
Saint-Lô
Denys Lerévérend
Bernay
Coutances
Saint-Pierre-sur-Dives
GAEC Debons
Thaise
Granville
Vire
Domaine INRAE du Pin
L'Aigle
Flers
Argentan
Avranches
Saint-Hilaire-du-Harcouët

Tour 5 – Normandy, land of horse breeding

Normandy is the primary French region for horse breeding. Many breeders take advantage of the rich grasslands to raise champion racehorses (Trotteur-Français and Pur-Sang) or sport horses (mainly Selle Français). This tour offers the opportunity to visit two horse farms and the IFCE training centre and technical platform.

The Ecurie des Monceaux, based in the Pays d'Auge, over 340 ha, offers an environment conducive to thoroughbred breeding. Since 2010, Ecurie des Monceaux has bred 43 stakes winners. With 200 horses, the breeding programme is geared towards horses breeding out as much as possible. Great attention is paid to pasture management using a mixed rotational grazing system with cattle.
The 2nd horse farm, called Haras des M, is a magnificent farm specialised in the production of high quality show jumping horses. Throughout the year, frozen semen production, insemination and embryo transplant activities are carried out. Pastures are managed using a rotational grazing system, providing high quality forage for the young livestock during the grazing season. Mixed grazing with cattle improves pasture quality and farm economic efficiency.

La Jumenterie du Pin, located nearby the famous Haras du Pin is dedicated to professional training in horse breeding and reproduction. It is now a technical platform dedicated to R&D projects in horse reproduction, breeding, as well as horse health and agroecology. Some of the current R&D projects will be presented, such as the management of parasitism in mixed grazing, the evaluation of environmental footprint and the management of manure on pastures.

The INRAE Experimental Unit of Le Pin

The Haras National du Pin estate covers nearly 1,200 hectares, including 250 hectares of forest and 700 hectares of grassland. The experimental unit of Le Pin, the main INRAE unit in Normandy, is one of the most important sites for animal production experiments (dairy cattle). It has a surface area of 350 ha, assigned to INRA since 1957. It is a privileged place for experimentation for research teams located in Jouy-en-Josas, Rennes, Clermont-Ferrand-Theix, Nouzilly and Caen. Collaboration is also underway with the University of Caen, regional professional organisations (Chambers of Agriculture, Cooperatives, etc.), the Institut Français du Cheval et de l'Equitation (IFCE), technical institutes and private firms. Together with the Herbipôle, the experimental unit is the INRAE bovine experimentation facility recognised at European level in the SMARTCOW Research Infrastructure (www.smartcow.eu). Finally, the unit is at the heart of one of the pilot territories of the LIT Ouesterel and its experimental set-up is used to support research into the characterisation of the animal welfare of dairy cows on pasture.

Research in animal production

The scientific work carried out at Le Pin is based on the two main systems described below. Experiments in bovine genetics and breeding systems require a large number of animals and are spread over a long period of time in order to ensure the necessary reliability of statistics and to eliminate annual effects as much as possible. The unit's skills are therefore focused on cattle breeding and large-scale phenotyping of a large number of traits: milk production and composition, blood metabolites, body weight, body condition score, cyclicity and reproduction, health events, etc. The fine characterisation of pasture is also a strong skill of the unit: measurements of grass growth, density, floristic composition, forage nutritive value, etc. The animals from these two systems are also the basis for a multitude of smaller projects that are grafted onto them.

Effialim experiment

Within the framework of a national research programme (ANR Deffilait) on feed efficiency in dairy cows, the Le Pin experimental unit has set up an experimental system of high-throughput phenotyping of Holstein dairy cows resulting from a divergent selection on body condition, in collaboration with the geneticists of the UMR GABI and the physiologists of the UMR PEGASE. The aim is to study the genetic determinism of feed efficiency.

Tripl'XL experiment

The objective of this recent experiment (Le Pin 2020-2026) is to evaluate the influence of the breed (Holstein, Normande and Jersey), its intra-breed format (Ho and No) and the allocation of concentrate at different moments of the lactation on milk performance, variations in body reserves and, more broadly, on the ability of dairy cows to produce and reproduce in a grass-based system with grouped calving. This protocol is managed by the UMR PEGASE and GABI. It also supports work undertaken with other INRAE researchers on animal welfare and the health of dairy cows (LIT Ouesterel).

Forage feeding value in vivo evaluation

A workshop to evaluate the feed value of forages allows the in vivo measurement on sheep of the feed value of grass from natural meadows, temporary meadows planted with pure varieties and in association. Other forages can also be evaluated: immature cereals, grass silage, hay, etc. This workshop provides information on the ingestibility and digestibility of all the forages distributed for the two main protocols described above.

Tools and resources

Two functional experimental facilities on two sites, l'Ermite and Borculo:

- More than 700 cattle, 350 ha of exclusively forage areas.
- 20,000 m2 of livestock buildings (15 stalls).
- 110 places for individual feed intake evaluation.
- Tools and sensors for the phenotyping of cattle.
- 260 dairy cows (300 calvings per year), 250 heifers, female calves.
- A support service (farm) manages the production and harvesting of fodder
- as well as all the infrastructures.

Collaborations (INRAE, public and private partners)

- Genetic abnormalities: breeding of animals with abnormalities (syndactyly, hypoplasia syndrome, hornless genes, udderless genes), procreation of foetuses at variable ages.
- Integration of specific measurements on the two major experimental programmes developed in the unit: milk quality, reproduction, calf health, bovine immunity, animal welfare.
- Zootechnical and agronomic trials related to breeding and agricultural production, in particular via the Smartcow IR.

Training

The experiments carried out in the unit allow for thesis work to be carried out under the supervision of the researchers. The unit welcomes 1 to 2 trainees from BTS to Engineer level for their final thesis and more than 1000 visitors each year.

Accompanying delegates programme

Monday 27th June

Morning

9:30 Rendez-vous at Caen University (Aula Magna hall) to go to the City Hall « Abbaye aux Hommes » (Esplanade Jean-Marie Louvel)

10:00 / 12:15 Caen city discovering

The visit of the old Caen with two guides is proposed. You will explore the « Abbaye aux Hommes » and walk around the Historical Center, to finish near the Castle

12:30 / 14:00 Lunch with EGF 2022 delegates at the Caen University

Afternoon

15:00 Rendez-vous at Caen University (Aula Magna hall) for derpature to Caen Memorial Museum. (15 min. by bus / Line 2, stop near the University)

15:30 / 17h30 Caen Memorial Museum

Free visit with audio guide of the most important museum about the D-day in Normandy and the Cold War. A museum for peace and never forget.

18:30 / 20:00 Welcome reception in the Aula Magna hall

Tuesday 28th June

08:45 / 16:00 Mid conference tours

16:30 / 18:30 Visit of the INRAE experimental Unit and Le Haras national du Pin

18:30 / 19:30 Equestrian show in the royal courtyard of Le Haras national du Pin

20:00 / 23:00 Gourmet dinner

00:00 / 00:30 Arrival to Caen

Wednesday 29th June

9:15 Rendez-vous at Caen University (Aula Magna hall) to go to the Caen Railway station to go to Bayeux by train. Train TER 852619 (Departure : 10:10 / Arrival : 10:26)

10:45 / 12:45 With a guide, walk through the old streets of Bayeux and visit the cathedral
Rendez-vous at La Roue à eau, rue de Nesmond (near the Parc d'Ornano).

12:45 / 14:30 You are waiting at the Restaurant La Terrasse
Go to the address: 4 rue Alain Chartier - Bayeux

15:00 / 17:00 Visit the amazing "Tapisserie de Bayeux", embroidery describing the epic adventure of William the Conqueror in 1066
Free visit with an audio guide - Entrance : 13B rue Nesmond-Bayeux

17:30 Back to Caen by train. Return to Caen University or to your hotel
Train TER 852632 (Departure : 17:32 / Arrival : 17:48)

18:15 & 19:00 Departures to the WIP by bus

19:30 / 23:00 Conference dinner

23:00 / 00:00 Back to Caen by bus

Thursday 30th June

Morning

9:00 / 11:30 Free moment for relaxing, shopping or self visits

11:30 / 12:30 EGF business meeting / Closing ceremony

12:30 / 13:30 Lunch with EGF 2022 delegates at the Caen University

Afternoon

14:00 Departure of the Post conference tour

The post conference tour
From Caen to Rennes via Le Mont St Michel

Thursday 30th June

14:00 / 14:15	Departure from Caen University
15:30	Omaha beach and The Colleville American cemetery visit
Evening	Dinner and night at the Hôtel Le Fruitier (Villedieu les Poëles)

Friday 1st July

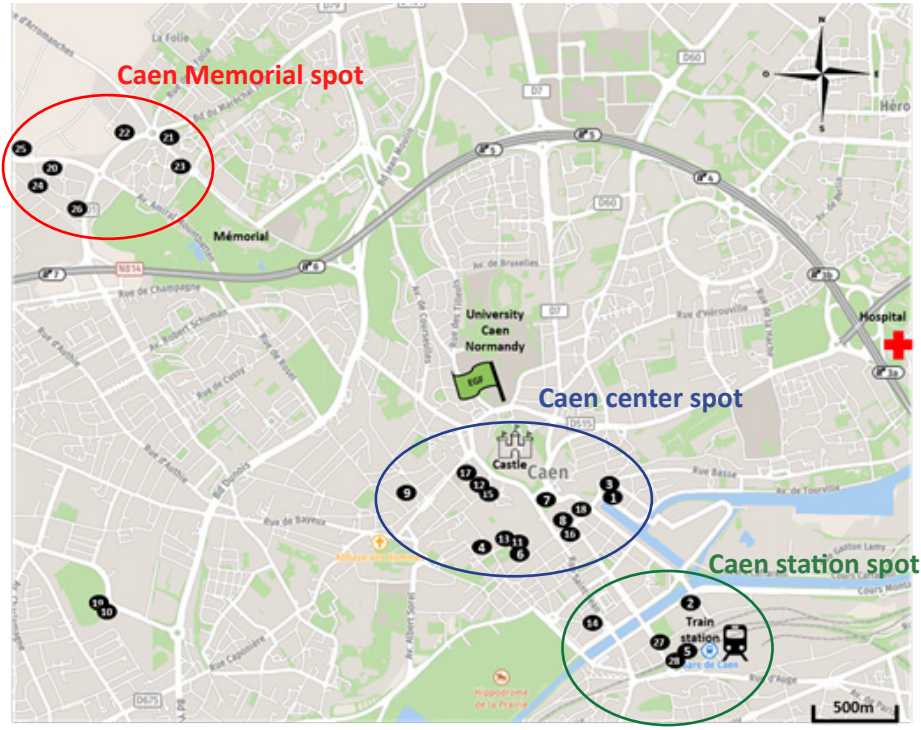
09:00 / 11:00	Visit of a grass grazed-based dairy farm - Welcome by Etienne Legrand, dairy farmer at La Meurdraquière
12:00	Picnic near the Mont St Michel
13:00 / 17:00	The amazing crossing of Mont St Michel bay by foot
17:00 / 19:00	Visit of Mont St Michel (audio-guide), from the door of the Roy to the cloister of the Abbey
Evening	Dinner and night at the Hôtel Vert (near The Mont St Michel)

Saturday 2nd July

09:30 / 11:30	A meeting with Sophie Esvan-Piat, the shepherd of the Ferme des Obiones, and her flock grazing on the salt grasslands of the Mont St Michel
12:00	Lunch
15:30	Visit of the Old city of Rennes

Evening	To conclude this post conference tour, a warm dinner in a traditional Crêperie
Night	Hôtel Ibis (Rennes) near the railway station for a departure Sunday morning

Caen city map and location of the hotels



1. Hôtel Mercure Caen Centre Port de Plaisance
2. Ibis Styles Caen Centre Gare
3. Ibis Caen Centre
4. Ibis Styles Caen Centre Paul Doumer
5. Ibis budget Caen Centre Gare
6. Best Western Plus le Moderne
7. Hôtel du Château
8. Hôtel Bernières
9. Hôtel Saint Etienne
10. Hôtel Zénith Caen Parc Expo
11. Hôtel la Fontaine Caen Centre
12. Hôtel le Dauphin & le Spa du Prieuré
13. Best Western Royal Hotel
14. Hôtel Bristol
15. Hôtel des Quatrans
16. Hôtel Astrid
17. Hôtel François d'O
18. Hôtel de l'Univers
19. Hôtel Ivan Vautier
20. Hôtel inspiration by Balladins Caen Mémorial
21. Brit Hôtel Caen Nord- Mémorial
22. ACE Hôtel Caen Nord Mémorial
23. The Originals City, Hôtel Otelinn
24. B&B Hôtel Caen Mémorial
25. Première Classe Caen Nord Mémorial
26. Hôtel Ibis Budget Caen Nord Mémorial
27. Campanile Caen
28. Hôtel Mary's

29th GENERAL MEETING

GRASSLAND AT THE HEART OF CIRCULAR AND SUSTAINABLE FOOD SYSTEMS

JUNE 26-30, 2022 • CAEN, FRANCE