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# Climate Mitigation Policies for Europe: The Net Zero Target and the Agriculture, Forestry and Land Use Sector

An agrivoltaic land-use mix

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# Editorial

Thierry de l'ESCAILLE, *Secretary General*

*Debates on the future of agriculture and forestry, while addressing many pertinent issues, are too often theoretical and even rhetorical, giving a sense that the thinking process is dominated by political passions.*

*Its understanding is not made any easier by the lack of economic incentives on the one hand and of concrete and practicable proposals on the other, giving rural farmers little confidence in what is being proposed.*

*ELO, to allow our members to move forward, has not only engaged in these debates, but has also launched a series of programmes or initiatives aimed at clarifying what is feasible and what is practicable. For example, we are developing an ambitious programme called AgriLife, which integrates beneficial adaptations to farm management and highlights available techniques. Regenerative agriculture, biodiversity production and verified carbon sequestration are at the heart of our interests. Many producers are able to do this and are in fact already practicing the essentials.*

*We are conducting this debate with major players such as the IUCN. Discussions took place with them at the World Conservation Congress in Marseille at the beginning of September. We are of course presenting the debate within the framework of the Forum for the Future of Agriculture, where will be discussed, as part of the forthcoming French presidency in Paris this 2 December, the ways and means for it to be put in place.*

*The task ahead of us is enormous, but we rural farmers are used to meeting challenges.*



© Small Wildlife of Fields & Meadows in Europe

# Climate Mitigation Policies for Europe: The Net Zero Target and the Agriculture, Forestry and Land Use Sector

*Policy Proposals from the European Landowners' Organization for UNFCCC COP26 at Glasgow, Scotland (UK), November 2021.*

**Michael SAYER, ELO Special Adviser**

This year we shall learn whether the world is still capable of rising to the challenge of meeting the objective set by the Paris Agreement of 2015 of limiting global warming to 1.5 degrees above pre-industrial levels, a level now expected to be reached by 2040 and probably soon after 2030, and whether reducing emissions to Net Zero by 2050 will now be enough. As climate negotiators prepare for COP26, there is still an emissions gap equivalent to between 1.2 and 1.7 degrees Celsius between national pledges contained in Nationally Determined Contributions and the cuts in emissions needed, as at 2015, to keep warming to 1.5 degrees. As at 31 July, 87 out of 197 parties to the Climate Change Convention still had not submitted updated NDCs. There was also a funding gap of some £21 bn out of the £100 bn climate finance agreed at Paris.

The Sixth Assessment Report of the Intergovernmental Panel on Climate Change makes it clear that even keeping warming to plus 2 degrees is now slipping from our grasp. Warming has increased by 0.2 degrees since 2000. Agricultural and ecological drought events occurring once in ten years in the later nineteenth century have nearly doubled in frequency. The year 2020 was globally one of the three hottest since 1850, plus 0.6 degrees over the 1981-2010 average: in Europe, with the higher latitudes warming faster, 2020 was the hottest year since 1850, with an increase of 0.9 degrees over the 1981-2010 average. Wildfires in July 2021 released an estimated 343 MtCO2 globally (Copernicus Atmospheric Monitoring Service). Although adopting a low emissions scenario (SSP1-1.9) would be capable of gradually reversing surface temperature increase below plus 1.5 degrees from about 2080, global mean sea level rise would still continue for several centuries.

## 1. The emissions gap in the Agriculture, Forestry and Land Use sector

The point of departure for this note is the gap in the Agriculture, Forestry and Land Use (AFOLU) sector between annual agricultural emissions from methane (CH4) and nitrous oxide (N2O) and annual net carbon removals (carbon sequestration) from Land Use, Land-Use Change and Forestry (LULUCF). For the EU (EU-KP including UK) in 2019, the gap amounted to 195 Mt CO2 equivalent (429 – 234 net LULUCF sequestration), compared with 191 Mt CO2eq in 2017. Agricultural emissions in both the EU and UK have remained steady since 2010, while removals in both cases have decreased.

The EU is now committed to achieving collective neutrality in the sector by 2035, reducing net emissions by 2030 to 39.9 MtCO2eq, a strategy primarily dependent on increasing annual removals to 310 MtCO2eq by 2030. This would still see Denmark, The Netherlands and Ireland as net sources of emissions from LULUCF in 2030. However, a more ambitious approach to reducing agricultural emissions could enable the sector to offset the emissions of other sectors by 2035. The UK on its own, with 13 per cent forest cover, could not aspire to sectoral neutrality by 2035 without major cuts in agricultural emissions.

## 2. The centrality of livestock and livestock systems to agricultural emissions

### *The weight of methane emissions from agriculture*

The structure of EU agriculture emissions in 2019 is shown below, from *Annual EU GHG Inventory 1990-2019 and Inventory Report 2021*, Fig. 5.3.

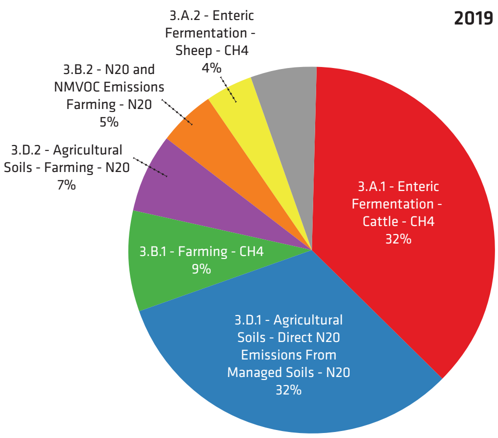


*Fig. 3. EU GHG emissions from agriculture in 2019 at 100-year GWP (Annual EU GHG Inventory 1990-2019 and Inventory Report 2021, Fig. 5.3).*

It will be seen that the direct weight of livestock in the emissions is 55 per cent consisting of categories 3.A.1 (CH4 from enteric fermentation from cattle, 37 per cent) plus 3.A.2 (CH4 from enteric fermentation from sheep, 4 per cent) plus 3.B.1 (CH4 from manure management, 9 per cent) plus 3.B.2 (N2O and NMVOC emissions from manure management, 5 per cent), the 3.B emissions being overwhelmingly attributable to cattle.

However, livestock systems, especially intensive systems with minimal dependence on grazing, are also dependent on cereal-based feed and also, in the case of poultry and pigs, imported soya.

Because arable land is used in part to grow livestock feed, a proportion (unquantified) of EU emissions in categories 3.D.1 (direct N2O emissions from managed soils, accounting for 32 per cent of agricultural emissions) and 3.D.2 (N2O from atmospheric deposition, N leaching and run-off, accounting for 7 per cent of agricultural emissions) is also indirectly attributable to livestock systems.

Although overall livestock emissions from enteric fermentation (category 3.A) have reduced by 21 per cent since 1990, this is a consequence of a 28 per cent fall in livestock numbers, and the overall figure masks increases from Spain and Ireland where the numbers of livestock rose. Meanwhile, the implied emission factor for dairy cattle has risen from 103 to 130 kg/head/year between 1990 and 2019, with a rise from 48 to 52 kg/head/year for non-dairy cattle.

It should be noted that emissions are reported as CO2eq based on a 100-year Global Warming Potential (GWP), following international practice for non-CO2 gases in National Inventories and using the val-

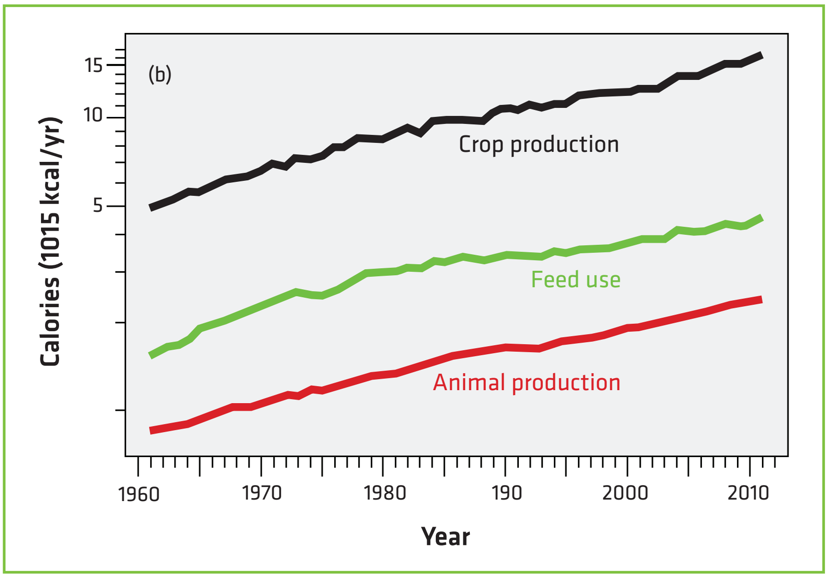


*Fig. 5. Climate Change and Land (2019), Fig. 5.2 (b).*

ues in the IPCC *Fourth Assessment Report* (AR4/1, Table 2.14). Because of the short atmospheric lifetime of $CH_4$ (conventionally taken as 12.4 years, although revised since the *Fifth Assessment Report* to 11.8 ± 1.8 years), use of its 100-year GWP of 25 significantly discounts its effect compared with the 20-year GWP of 72. By comparison, this discount effect does not occur with $N_2O$, with a much longer atmospheric life (conventionally 121 years, revised since AR5 to 109 years ± 10 years), GWP/100 of 298 and GWP/20 of 289. These considerations have led to proposals to adopt metric approaches such as GWP* or combined Global Temperature Change Potential (combined GTP).

For example, the application of 20-year GWPs to EU agricultural GHG emissions for 2019 would show agricultural emissions doubled to 856,629 Mt $CO_2$eq and would bring $CH_4$ emissions in categories 3.A.1, 3.A.2, 3.B.1 and 3.B.2 from 55 per cent to 76 per cent of the total.

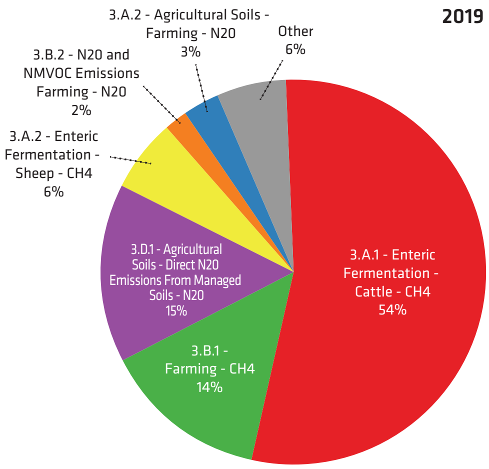


*Fig. 4. EU GHG Emissions from Agriculture in 2019 at 20-year GWP.*

Moreover, the IPCC Fifth Assessment Report (AR5/1, Tables 8.7 and 8.A.1) revised the GWPs: hence $CH_4$ GWP/100 would become 28 with a GWP/20 of 84, while $N_2O$ GWP/100 would become 265 with a GWP/20 of 264. The AR5 GWP values are expected to be introduced in National Inventories under the Paris Agreement from 2022-2023, and are the basis for EU Regulation 2021/0201. Although non-$CO_2$ GHGs will still be reported at GWP/100, the new values will show an increase in the weight of livestock emissions compared with current values.

***Livestock feed and cereal consumption***.

Figure 5.2 (b) from *Climate Change and Land* (IPCC, 2019), indicates the global growth in animal production and the corresponding use of crop production for animal feed since 1960.

The EU is the world's largest meat exporter. Figures for EU consumption show that nearly two-thirds of cereals grown in the EU are used for animal feed, one third for human consumption and 3 per cent for biofuels. In addition, soya is imported from the US, Brazil and Argentina as meal or as raw beans, of which the Netherlands, Spain and Denmark are the largest consumers (EU data), principally for poultry and pigs. The expanding cultivation of soya in South America has been particularly associated with land-use change over the last sixty years.

Most cereal-based feed is consumed by year-round housed livestock, whereas grazing livestock tend to be fed on silage, hay or straw while housed in the winter months. However, there is a growing trend for small farms to develop intensive livestock systems where cattle are housed and the land is used simply for silage and dumping the slurry. Thus intensive systems overturn the principle that the grazing capacity of the land defines the number of livestock.

***Strategies for reducing emissions from livestock***

At the same time, it is difficult to see how a significant contribution to reaching net zero can be made by European agriculture without a reduction in livestock numbers. This is because fundamentally the processes generating the emissions are less amenable to substitution and efficiency than in the case of $CO_2$.

This might be done, potentially, by bringing numbers of cattle into line with permanent pasture and by reducing as far as possible prior cycles of emissions from the use of arable land for growing livestock feed. Policy should then aim to support extensive livestock systems well integrated with their environment.

In the case of cattle, diet and manure measures are likely to be too marginal to bring a big reduction in emissions. Moreover, intensification already locks livestock systems into prior cycles of emissions.

***Resulting Land-Use Change and other adjustments***

Any reduction in livestock numbers is likely to have consequences for land use. In so far as grazing livestock are concerned, this would offer scope for a switch to forestry. In so far as intensive or housed livestock are concerned, there would also be scope would be for reallocation of arable land to other crops, including bioenergy within the annual cropping cycle. New uses will also need to be found for cereal crops which only achieve feed quality due, typically, to seasonal factors.

At the same time, manure management measures would have to be concentrated on the period in the year (normally winter) when the livestock are housed.

**Nevertheless, the livestock sector will need significant support to make a substantial contribution to the transition to Net Zero, and much of this will have to be focussed on assisting diversification for businesses dependent on intensive livestock.**

# TIME FOR CHANGE

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***Potential reductions in nitrous oxide emissions***

Because of the relative intractability of the Nitrogen cycle, reducing use of N-based fertiliser remains the principal option for reducing N2O emissions. One way this might be achieved is by longer arable rotations. For example, the Holkham estate (Norfolk, UK) has lengthened cropping rotations to improve fertility, using a six-year rotation avoiding consecutive straw crops (winter barley, oilseed rape, winter wheat, potatoes, spring barley, sugar beet). The Esterházy estate (Burgenland, Austria) converted to organic agriculture in 2003, introducing a nine-year rotation which includes lucerne and oats or another fodder crop for grazing livestock (currently 120 animals).

More work would need to be done to establish the viability of this reduced-input option.

Precision farming and use of cover crops are useful complementary measures, but are likely to be too marginal to be game-changers, and too open to issues of measurement/verification and permanence.

## 3. Increasing Carbon Sequestration

Bearing in mind the need for additionality, monitoring, verification and permanence, the most attractive measures will involve land-use change through afforestation or, where appropriate, a switch from arable to permanent pasture. Because of the very long, inter-generational economic time-scale, afforestation (and reforestation) will need to be supported by grants for establishment (planting and care of the seedlings when still at risk) and later by supporting Sustainable Forest Management (including thinning).

Afforestation (and reforestation) ought to be treated also as a climate adaptation (**resilience**) measure, although locally (e.g., restoration of flood plains) conversion of arable to permanent pasture may be more appropriate.

**The design of sylvicultural systems will be very important in order to optimise resilience, carbon stock and potential for substitution.** There must be a preference for mixed and, eventually, uneven-aged, continuous cover structures, coupled with use of a periodic forest inventory (setting out standing volumes by species and growth classes, to show the standing volume with annual increment and annual harvest).

**There is, however, considerable scope for improving undermanaged small woodlands, which are a measure of the under-mobilisation of resource, both as regards sequestration and substitution, due to poor market signals**.

Agroforestry is a low-threshold measure which can increase resilience and small scale carbon storage. Examples include the planting of trees in field corners, on pasture (*dehesa*, parkland) and in hedges, besides the creation of new hedges. The UK government expects an increase of 40 per cent in hedgerow length to be required as part of reaching Net Zero.

Approximately one third of the world's soil carbon is held in peat. Restoration (re-wetting) of peatland degraded by drainage and/or overgrazing is another essential, albeit localised measure. Some 100 peatland restoration schemes exist in Scotland, including on a number of accredited Wildlife Estates (PHILIPHAUGH, ROTTAL).

The EU commitment to reach 310 MtCO2eq annual net sequestration (an increase of 76 MtCO2eq on 2019) by 2030 would equate to 39 per cent of the sectoral gap in 2019 at GWP/100 but only 12 per cent of the gap at GWP/20 (2019 figures inclusive of UK net removals of approx. 1 MtCO2eq). It will also be increasingly challenged by wildfires, and effective fire prevention measures will be essential to success. At the same time, the 3 billion additional trees to be planted by 2030 under the Forest Strategy will only start to provide significant removals after 2050.

## 4. Material and Energy Substitution

This is very much part of afforestation and reforestation. At one end of the scale, the scope for substitution, with provision of a wood-based carbon pool, is indicated by wooden blocks of flats being built in, e.g., Sundby (Stockholm) and elsewhere. The need to develop strong markets here is clear. One way would be through appropriate building regulations.

In forest management, while respecting the 'cascade' principle, bio-energy from thinnings and waste will be complementary to substitution for construction and furniture, and the EU and UK **should develop targets for both**. Land-based energy substitution can be encouraged by the inclusion of energy crops within the annual cropping cycle. This would potentially include the use of feed-quality wheat for bio-ethanol.

Small-scale hydropower is another clean energy source, but currently limited by the need to develop techniques for generation where the head of water is less than 2m. It is important to observe the needs of biodiversity, such as provision of fish passes with counters which then monitor populations.

Solar power is possible on almost all estates. At small scale, this may be achieved by combining solar panels with fruit, vegetables or sheep farming.

*Fig. 11. The Attadale estate, an accredited Wildlife Estate in Wester Ross, Scotland has four hydro schemes generating a total of 4.8 MW.*

*Fig.1 Wildfire in Siberia, July 2021*

## 5. A summary of some available measures

**Afforestation**

Grants to establish new afforestation (planting, natural regeneration).

Thinning grants for management to enable optimum growth.

Annual stewardship grant (comparable, e.g., to Higher Level Stewardship in UK).

Trading of carbon in post-1990 afforestation on the basis of time- limited certificates linked to the periodicity of the forest inventory. Under such a system, the onus would be on the buyer to renew.

**Introduction of a requirement for a forest inventory** as a condition of C trading and of grants for above a given area (say 0.5 ha).

Adaptation of the structure of forests by species and age classes to give greater resilience against drought, fire and disease, and to increase potential sequestration and substitution.

Inclusion of afforestation and substitution objectives in Nationally Determined Contributions.

**Agroforestry**

These are essentially complementary measures which will increase local resilience as well as sequestration, e.g.:

hedgerow planting and/or management,

increasing the number of hedgerow trees,

planting trees on permanent pasture (parkland, dehesa).

Stewardship-type grants should be available for the above, depending on the level of ambition.

**Peatland restoration grants**

An ambitious programme to extend restoration of degraded peatlands.

***Because of the time-lag in optimising additional sequestration and substitution, the structure of Net Zero will potentially change over time. It is therefore necessary to take a policy view of 2100 as well as 2050.***

**Livestock**

Buy-out of excess livestock numbers (herds or part herds). This could be timed to coincide with normal replacement. It would be for consideration whether this might also be structured as a capital/retirement payment.

Stewardship grants for livestock on permanent pasture at agreed stocking rates.

Compulsory manure management for housed livestock, including when seasonally housed.

Complementary measure: adjustment of feed balance for housed livestock, where additional emissions are not generated.

**Reducing use of artificial N fertiliser**

Support of N-fixation through the inclusion of leguminous crops within a lengthened arable rotation.

Precision farming. This is an important but essentially complementary measure.

**Bioenergy**

Development of the bioenergy option ***for break crops within the annual arable rotation and for cereals failing to reach milling or malting quality***, e.g. bioethanol as a use for feed-quality wheat or barley and for sugar beet.

Support for *Miscanthus* and short-rotation coppice.

Use of small timber, thinnings and sawmill waste for biomass.

**Hydropower**

Development of small-scale hydropower with provision of fish passes where appropriate.

**Solar power**

Development of solar power at a range of scales, with provision of appropriate grid infrastructure.

**The full version of this Position paper is available on ELO website.**
**For further information please contact Michael SAYER**
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JOINT PRESS RELEASE

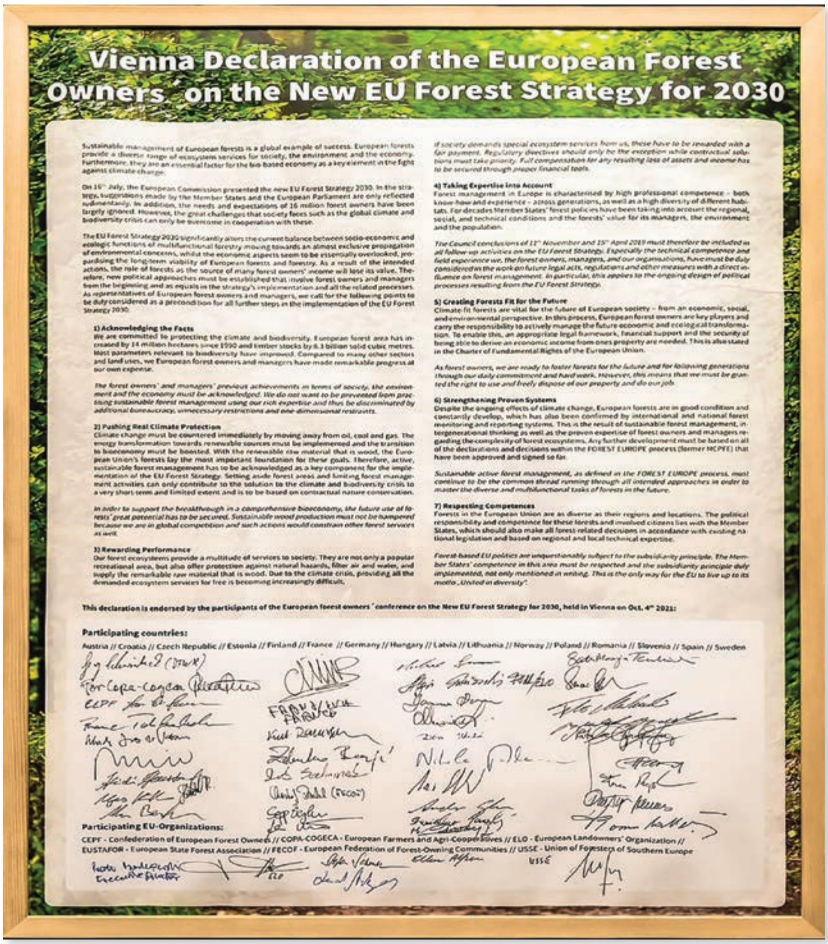
# European forest owners and managers call for major clarifications on the new EU Forest Strategy

"The new EU Forest Strategy for 2030 needs clear objectives and feasible coherent actions" was the message of forest owners and managers to the EU policy makers from the European Forest Owners' Conference. The conference, organised on 4 October in Vienna, brought together European and national forest owners' organisations, state forest organisations and MEPs to discuss and exchange on the new EU Forest Strategy. During the conference CEPF, EUSTAFOR, Copa-Cogeca, ELO, USSE and FECOF presented a joint position on the new strategy which echoes the concerns raised in Vienna.

*On the next day in Vienna, Austria, Germany, France, Slovenia, Sweden and Finland have again expressed their concern over the EU's Forest Strategy for 2030, arguing in a press release that the text is unbalanced and failed to address the growing pressure on forests.*

Substantial concerns were voiced by the conference participants as the new strategy undermines the current balance of social, environmental and economic pillars of sustainable and multifunctional forestry in the EU. European forest owners and managers were among the most active and supportive of a new strategy and convinced that it was needed to better address the challenges and opportunities of the sector and to achieve new Green Deal objectives through a consistent and well-coordinated framework at EU level. However, these hopes have been dashed with the new strategy.

The joint position paper presented at the conference explains main reasons why European forest owners and managers are highly worried about the strategy and deem it inadequate. The paper also raises some key questions and remarks with regards to the implementation of the strategy. It highlights four actions that were announced in the strategy and are in need of major clarifications and explanations prior to further development of these initiatives:




1. New EU indicators, thresholds, and ranges on sustainable forest management
2. New EU voluntary closer-to-nature forest management certification scheme
3. Development of payment for ecosystem services
4. New legislative proposal on EU Forest Observation, Reporting and Data Collection

European forest owners and managers acknowledge the importance of reaching EU objectives and are determined to deliver their part. However, if EU policies related to forests continue to lack coherence and disregard the input and concerns of those who are managing them and will be given the ultimate responsibility of implementing these policies, there is a strong risk of infeasibility. Forest owners and managers have a lot at stake in their forests. To remain motivated and contribute to the long-term viability of rural areas and EU economy, they are in need of constructive signals from European policymakers.

**The joint position paper and the Position of European Forest Owners and managers are available on ELO website – Issues and Policies – Forestry.**


# Agriculture and Land Health: the common ground between agriculture and conservation

*The aims of this Dialogue, organized during the IUCN World Conservation Congress in September in Marseille, were to strengthen commitments at the Food Systems Summit, CBD COP15 and UNFCCC COP 26 to restore biodiversity through sustainable agriculture.*

Farming depends on nature, but also contributes to biodiversity loss, for example through soil degradation and habitat loss. Sustainable agriculture restores land health, conserves soil biodiversity and maintains ecosystems that provide many services to society, including climate regulation and water supply. The dialogue focused on examining policies to protect biodiversity in agricultural ecosystems. It also explored sustainable farming at the heart of food system transformation, supporting productivity, sustainability and resilience, while equitably distributing benefits to society. As underlined by Dr QU Dongyu, FAO Director-General in his video-message "FAO is committed to support its Members to transform to MORE efficient, inclusive, resilient and sustainable agri-food systems for better production, better nutrition, a better environment and a better life for all, leaving no one behind." Thierry de l'ESCAILLE, ELO Secretary General, underlined during the panel discussion "*If we want to see those desired changes and deliver sustainability targets we will need to take a holistic approach that bridges together public and private actors, tools and practices. With the considerable amount of European land under private ownership, private landowners have a central role to play as guardians of our environment and countryside*".
(red.)

**For more information, please visit**
**www.iucncongress2020.org**

# What the wolf teaches us about today's society

**Stijn VERBIST, Lecturer in Legal Protection against the Government, Lawyer, Advocate for Fundamental Rights**

## The wolf and the longing for authenticity

We hear so often that people are looking for authenticity and connection that these concepts threaten to lose all meaning. The waiting lists of therapists, coaches and psychologists teach us at least that a large group of people is struggling with restlessness, discontent and fear of not conforming, in having or in being. Digitalisation and industrialisation, consumerism and the urge for comparison have probably alienated many men and women from the ability to lead an 'ordinary' life, or at least to find peace in it. The fact that we all have to learn to think in non-binary terms does nothing to put an end to the eternal desire for polarisation. In the spirit of Jean-Jacques Rousseau, the contrast between good, pure nature and the evil, corrupt society is back in fashion. However, most people are so alienated from nature that they idealise it on the basis of photos and films. Nature organisations and politicians, consciously or unconsciously, play cleverly into this. And this is where the wolf comes into the picture. The wolf as a symbol of what is wild and untamed, free and unbound. What we all want to be. The wolf as a neo-archetype of the phrase 'authenticity'.

## The Wolf as the New Messiah

But the wolf is much more. For want of peace with the here and now, people have always clung in large numbers to signs of hope and salvation. History shows that these signs often had the opposite effect: instead of taking fate into their own hands, people went into a mode of dependence and hope of being saved. Those waiting for rescue from outside often forget to swim themselves and drown. The climate is not doing as well as it should, but the arrival of the wolf gives hope. The wolf, which was exterminated in the 19th century, is back, alive and kicking. The wolf is a symbol of victory over urbanisation and industrialisation. It has, as it were, risen from the dead. The return of the wolf is therefore cultivated as a miracle. This messianism is of course accompanied by the necessary privileges (a lot of media attention and law professors and biologists who spontaneously present themselves as their protectors) and - so it seems - with cows, lambs and ponies on the sacrificial table.

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## The wolf as a distraction

For the (non-)policies of the past decades on nature, agriculture, spatial planning and mobility, we pay a very high price today. The past water disaster has (well) made the forum for climate change negationists very small. But it has also made it painfully clear what can and cannot be expected from a government, both in the prevention of floods and in the help and care afterwards. Our climate is not doing well and the government has knowingly done very little about it in recent decades. The wolf offers a welcome distraction from the climate misery and the crushing responsibility that (also) the government bears for it. People do not look where they want to look. People look where the system wants them to look. Every cow animal that is ripped open is thus given its place in a neo-modern Bread and Games as a tried and tested technique for pushing people's attention in the desired direction and thus getting them to fall into line.

## The wolf and property

Whoever has suffered damage, and complains about the wolf, gets the reproach that he did not adequately protect his herd from nature, that he did not install the right fence or did not pay enough attention. Thus, the victim is immediately blamed. The current opposing views on the wolf also betray a deeper evolution in our view of property rights. Its exclusivity and inviolability are under pressure. That the wolf does not respect property boundaries can hardly be blamed on him. But it hardly arouses indignation that this happens, that the wolf damages livestock and that it is difficult for owners to protect themselves against this. The fact that landowners and farmers are hardly electorally significant makes them vulnerable. This seemingly innocent erosion of property rights has major consequences for the whole community in the long run, both in terms of availability and affordability of housing and in terms of availability and affordability of climate-smart food. Sustainable agriculture and sustainable housing development, like the wolf itself, need space. The scarcer that space is, the smaller the supply and the higher the price.

## The wolf and open space

The wolf is returning to a land that is incomparable to the land from which it was once driven. The open space in Flanders (half of which is privately owned) has been shrinking systematically since then. The wolf's need for a large habitat confronts us with this increased scarcity, as would a whale in, say, the Albert Canal. We may welcome the wolf today, but what if the wolf continues to multiply successfully within a few years? (The wolf's offspring get about the same media attention as the offspring of British royalty). Will a reserve then be created for farmers and other animal keepers? Because let's be honest: one hundred percent conclusive prevention against wolf damage, just like against martens and foxes, is virtually impossible in practice. The wolf may have rights, but every right of man or animal is limited by the right of every other man or animal.

This is what the wolf teaches us. Therefore, it should not be shot, completely unaware of its social impact. The wolf is a powerful animal and is allowed to exist, but let us not make it a saint.

# Plain language in agriculture communication – a bridge for citizen trust.

*"Nothing in life is to be feared; it is only to be understood.*
*Now is the time to understand more, so that we may fear less."*
*– Marie CURIE-SKŁODOWSKA.*

**Cristina NOBRE SOARES, Science Communicator, regional ForumforAg 2021 in Portugal moderator**

I often quote this in my science communication with plain language classes. Maybe it's a way to remind my students that we fear everything we don't understand. And that's why it is so important to share scientific knowledge through an accessible language so that everyone understands.

And this is equally true when we communicate more controversial agricultural issues, such as Genetically Modified Organisms (GMOs) or gene-editing techniques (NGTs.)

GMOs and NGTs have promising developments in plant disease resistance, drought tolerance, and better nutrition. Therefore, farmers could reduce the crop's need for pesticides, water, and fertilizers. So, at first glance, GMOs and NGTs could be a tool for achieving greater sustainability in agriculture. Yet, there is a significant societal concern. And fear.

**And why does this happen?**

Well, I could talk about the lack of science trust. I could talk about the spreading of digital disinformation. Or about the public's fears, beliefs, and cultural motivations. Indeed, we have to manage too many complexity layers when engaging the public with some scientific and technological themes.

Yet, there is one layer that we should tackle first.

**And that is language.**

Language is often an irrelevant issue. But it isn't. The language scientists use to communicate such complex themes as NGTs is the first bridge established between agronomists, scientists, and the general public. And I'm not talking about the language you choose to speak; I'm talking about how we speak to the public.

I'm talking about how clear we must explain complex concepts, as NGTs, to someone who doesn't have the same knowledge as scientists have but, as a consumer, needs to know what is at stake.

The language that farm scientists and agronomists use makes agriculture communication even more complex. Because, like other several scientific subjects, agriculture is full of specific terms (jargon) and unfamiliar abbreviations, and the general public doesn't know what they mean. And people don't trust in what they don't understand. The challenge is, through communication, to build a level of trust and give people the confidence to make their own decision based on facts explained in a way they really understand.

To achieve that level of trust, agronomists and farm scientists have to put themselves in the audience's shoes. They must ask themselves: Do the audience understand what I'm saying? What do they already know about the subject? Why do they need to know this? What are their fears? This is halfway to more engaging communication, which is fundamental to deliver the message to the public.

And the first step for public engagement is getting down from the academic and technical ivory tower and use simple and clear language that everybody understands. Everyone has the right to understand, especially when it is about the food they eat, their health, and their life. This right to understand is a way of empowering communities.

So, if people can understand what is at stake, maybe fear and doubt could be replaced by better decisions. An informed consumer is probably a citizen who trusts more in new agriculture technologies. And who sees them as a path for agriculture environmental sustainability while providing food quality and safety.

But we can tackle these communication problems by building an accessible bridge between science and citizens called plain language and empowering them through the "right to understand". And keeping in mind that we neither care nor trust in what we don't understand.

Using plain language may seem a small step for agriculture communication, but it certainly is a great step to build citizen's trust.



# Taking land seriously in spatial flood risk management

LAND4FLOOD



Floods are one of the most significant nature hazards in Europe, not only along major rivers, but also along smaller streams and rivers. Flooding can cause severe damage – as experienced in July during the extreme events in Germany, Austria, and the Benelux countries. Climate change will likely increase its frequency and intensity. Dikes and dams need to be increasingly complemented by measures for water retention in the entire catchment.

The retention can occur in the **hinterland** using services of nature (lakes, wetlands, vegetation buffer strips retaining water before it reaches rivers), **along the rivers** (re-meandering, floodplain restoration, polders) or in **resilient cities** (rain gardens, green roofs, retention ponds). Retention measures, however, claim **more land** than traditional techniques. This land is often used intensively by private landowners. Claiming such land for retention raises conflicts over private property rights.

Mobilizing upstream land for water retention or temporal flood storage thus raises complex issues:

a) Cause and effects of measures are often not well understood. **Information** about river-basin connectivity needs to be transparent.

b) Flood retention on private land involves many different actors and institutions. Flood-risk **governance** can alleviate conflicts.

c) Activating private land for water retention requires **compensation** mechanisms that link those providing retention services with those who benefit from them.

Since 2017, a group of academics and practitioners from 35 countries collaborate in the European **LAND4FLOOD: Natural flood retention on private land** COST Action – sharing knowledge and experiences, collecting good practices from workshops with stakeholders. LAND4FLOOD (learn more: http://www.land4flood.eu/).

**Key policy messages** have been articulated based on the intensive LAND4FLOOD networking:

- Money for flood storage measures implementation is not enough: Multiple instruments and strategies - land for land swaps, production-loss compensations, conservation easements, tax exemptions – must be activated.
- Start working on the small scale: Comprehensive river basin plans are impressive but they will not come into practice without working with individual parcel owners. Activation of land owners is vital and generates the domino effect regardless of the situation of the most efficient retention sites.
- Take time to get landowners on board: Land-use changes purposefully decreasing land productivity are painful. Careful and continuous balancing of individual views with societal benefits is needed.

Landowners represent a conscious and conservative stakeholder group. The land is the foundation of their income and, often, identity. As such, they need to become part of flood-resilient strategy development and implementation, joining academics, experts and other stakeholders.

*Information is based upon work from COST Action LAND4FLOOD supported by COST (European Cooperation in Science and Technology, www.cost.eu).*

cost
EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

nadace partnerství
LIDÉ A PŘÍRODA

environmental partnership association

# Promoting sustainable use of underutilized lands for bioenergy production through a web-based Platform for Europe

*Bioenergy is a key element for reaching the EU climate targets and the Sustainable Development Goals. To ensure sustainable bioenergy production, marginal, underutilised and contaminated (MUC) lands may present a viable option as they do not compete with food and feed production but can still produce biomass for energy purposes.*

**Lindsey CHUBB, ELO**


*Biodiesel plant*

industry player interested in implementing sustainable bioenergy projects and need an indication of achievable performance for your idea, discover how BIOPLAT-EU can support you in taking this decision.

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This project has received funding from the European Union's H2020 research and innovation programme under Grant Agreement number 818083.

The overall objective of the BIOPLAT-EU project is to promote the market uptake of sustainable bioenergy in Europe using marginal, underutilized, and contaminated lands for non-food biomass production through the provision of a web-based platform that serves as a decision support tool.

The BIOPLAT-EU WebGIS tool provides a comprehensive online platform for supporting the decision-making process for new bioenergy investment projects that rely on biomass from MUC lands in Europe and neighbouring countries.

This comprehensive free platform includes information about the project, a helpdesk and the webGIS tool. The webGIS tool allows users to search for MUC lands in Europe, to select a suitable crop and bioenergy pathway and conduct a sustainability assessment that provides the user with specifications about the land including GHG emissions, water footprint, impacts on employment, among many others.

The project conducted detailed feasibility studies and business models of the bankability of 12 value chains in 6 different countries (Germany, Hungary, Italy, Romania, Spain, and Ukraine). The BIOPLAT-EU industrial partner, NESTE, successfully used the webGIS tool to conduct a pan-European assessment to explore MUC lands suitable for oil crop production in Europe.

If you are a farmer, landowner, investor, or


*Local marginal area*

# The use by farmers of fertilisers made from recycled nutrients will help European agriculture take a major step forward towards a circular biobased economy

*Moving towards a circular economy has in recent years become an often-espoused solution to many of today's global challenges, and rightly so. As is now becoming common knowledge, our current linear model of production and consumption – one in which raw materials are collected, then transformed into products that are used until they are finally discarded as waste - is not sustainable. Companies, policy makers and scientists across industries are working out how to gear their production to use less resources, emit less greenhouse gas emissions, and develop products that can be more easily recycled.*

Agriculture was, for hundreds of years, a circular model. Animals were fed on pastureland and crop waste locally, and their manure was returned to the fields to provide nutrients for the next cropping season. However, in the last 80 years the sector has gone through a phenomenal transformation. The specialisation of farming and the importation of feed has allowed our farming system to supply an ever-growing global demand. But it has, as we now realise, come with a heavy burden for the environment, our climate, our health, and indeed our future food security.

We are now at a crux in food production that presents us with an enormous opportunity. Through combining our ancient wisdom of nature-based farming, with decades worth of cutting-edge science, there is the potential to produce a system that is productive, resilient and supports our natural capital. And for nutrients, the path is already set.

Agriculture today is heavily reliant on synthetic mineral fertilisers to provide the essential nutrients needed for crop growth. 75% of all phosphorus used in synthetic mineral fertilisers in the EU comes from mineral sources – mostly imported and mined from non-renewable phosphorus rock. 65% of nitrogen used in these fertilisers is mineral nitrogen – produced through the Haber Bosch process, a process that consumes large amounts of fossil fuels such as natural gas. These nutrients are added to the land for crops to grow, removed from the land in the harvest and then eventually converted into waste as they journey through the food system, contributing to nutrient pollution. The greatest accumulation of these nutrients occurs in areas of concentrated livestock production (through manure) and in urban areas (in sewage sludge and food and municipal waste). This accumulation of nutrients is having severe adverse effects on soil, air and water quality and threatening the long-term sustainability of EU agriculture.


Ammonium Sulphate solution

EU fertilising product (2019/1009)[1], RENURE material (proposed by JRC)[2]

CHEMICAL ANALYSIS
(Ammonium sulphate obtained via FiberPlus with use of gypsum)

Ammonium sulphate solution 5 (+6)

| | |
|---|---|
| 5 % (± 0.5 %) | N water-soluble ammonium nitrogen |
| 6 % (± 0.5 %) | S water-soluble sulphur |

Solution: typical properties

| | |
|---|---|
| Density: | 1,1 kg/l |
| pH: | 6.5 bis 7.8 |

CHEMICAL ANALYSIS
(Ammonium sulphate obtained via other type of stripping and/or scrubbing with $H_2SO_4$)

Ammonium sulphate solution 8 (+9)

| | |
|---|---|
| 8 % (± 0.5 %) | N water-soluble ammonium nitrogen |
| 9 % (± 0.5 %) | S water-soluble sulphur |

Solution: typical properties

| | |
|---|---|
| Density: | 1,2 kg/l |
| pH: | 4 bis 7 |

Description

Ammonium sulphate solution - $(NH_4)_2SO_4$ solution - is a mineral nitrogen/sulphur fertiliser derived from anaerobic digestate using calcium sulphate ($CaSO_4$) or sulphuric acid ($H_2SO_4$) as a scrubber agent.

$(NH_4)_2SO_4$ solution contains all nutrients in a fully water-soluble form, which are therefore directly available to the plants. The combination of N and S enables a demand-based supply for the plants with both nutrients, suitable for all kinds of agriculture (except organic farming). $(NH_4)_2SO_4$ solution is an ideal fertiliser for plants that are in need of high S amount, such as grassland, rapeseed, maize, rye, wheat, cabbage, onions, celery and sugar beets.

Application

The $(NH_4)_2SO_4$ solution is a N containing S fertiliser. Meaning, N fertilisation limits must be taken into account during its application, and the use should be guided by the fertility status of the soil. It is recommended to apply $(NH_4)_2SO_4$ solution during the early growth phase of the plant, e.g. for maize this will be at the stage that the plant has 3-4 leaves.

(1) Regulation (EU) 2019/1009 of the European Parliament and of the Council of 5 June 2019 laying down rules on the making available on the market of EU fertilising products and amending Regulations (EC) No 1069/2009 and (EC) No 1107/2009 and repealing Regulation (EC) No 2003/2003, will apply from July 7th 2022.

(2) Criteria proposed by Joint Research Centre (JRC) for potential categorisation of so called RENURE materials is a proposal and not active legal framework. For more information on this study please see: Huygens D, Orveillon G, Lugato E, Tavazzi S, Comero S, Jones A, Gawlik B, Saveyn HGM, Technical proposals for the safe use of processed manure above the threshold established for Nitrate Vulnerable Zones by the Nitrates Directive (91/676/EEC), EUR 30363 EN, Publications Office of the European Union, Luxembourg, 2020, ISBN 978-92-76-21539-4, doi:10.2760/373351, JRC121636.

Horizon 2020 — SYSTEMIC receives funding from the European Union's Horizon 2020 Framework Programme for Research and Innovation under Grant Agreement no. 730400


Mineral Concentrate from processed manure or digestate

RENURE material (proposed by JRC)[1]

CHEMICAL ANALYSIS
(Mineral concentrate obtained from co-digested pig manure at Groot Zevert Vergisting)

Mineral Concentrate

| | |
|---|---|
| 0.8 % (± 0.5 %) | N water-soluble ammonium nitrogen as $NH_4$ |
| 0.4 % (± 0.5 %) | S water-soluble sulphur |
| 0.8 % (± 0.5 %) | $K_2O$ water-soluble potassium |
| <0.03% | $P_2O_5$ |

Solution: typical properties

| | |
|---|---|
| Density: | 1,0 kg/l |
| pH: | 7.5 to 8.5 |

Description

Mineral concentrates are produced from manure or digestate through a process of solid/liquid separation followed by reverse osmosis. The concentrate after reverse osmosis is here referred to as mineral concentrate. Mineral concentrates contain at least 90% of the nitrogen in the form of ammonium ($NH_4$) which is fully water-soluble and plant-available. Though primarily used as an N fertiliser, these mineral concentrates also contain notable levels of other macro-nutrients including potassium and sulphur but not phosphate. The composition may differ depending on the origin (production plant) of the concentrate. Mineral concentrates can be used as N/K/S fertiliser on grassland and arable land.

The use of mineral concentrate as an alternative for synthetic N fertiliser is beneficial in terms of lowering greenhouse gas emissions since it reduces long-distance transport of manure and lowers the use of synthetic N fertiliser within the region of the plant.

Application

Mineral concentrates should be applied by means of injection in order to prevent ammonia emissions. In the Netherlands and in Flanders (Belgium) this is in force in national regulations. JRC proposed this as a criteria for all RENURE materials that have a pH above 5.5. If applied correctly, the nitrogen use efficiency of mineral concentrates is similar to that of artificial nitrogen fertilisers. Mineral concentrates typically contain less than 1% N which is low compared to synthetic fertilisers and this may require adjustment of application equipment used for injection of artificial fertilisers in order to apply the desired amounts.

(1) Criteria proposed by Joint Research Centre (JRC) for potential categorisation of so called RENURE materials is a proposal and not active legal framework. For more information on this study please see: Huygens D, Orveillon G, Lugato E, Tavazzi S, Comero S, Jones A, Gawlik B, Saveyn HGM, Technical proposals for the safe use of processed manure above the threshold established for Nitrate Vulnerable Zones by the Nitrates Directive (91/676/EEC), EUR 30363 EN, Publications Office of the European Union, Luxembourg, 2020, ISBN 978-92-76-21539-4, doi:10.2760/373351, JRC121636.

Horizon 2020 — SYSTEMIC receives funding from the European Union's Horizon 2020 Framework Programme for Research and Innovation under Grant Agreement no. 730400

Recovering and reusing nutrients from biowaste (manure, food waste and even sewage sludge) is a crucial component of a biobased circular system and will contribute to Europe's transition to a carbon neutral economy, can support the decoupling of economic growth from resource use, and help restore biodiversity and cut pollution.

The RISE Foundation has been working as part of the H2020 SYSTEMIC project to support biogas plants upscale the extraction these precious nutrients from biowaste to an industrial scale, and tailor them to farmers' needs. They may then be used to replace, or be mixed with, synthetic mineral fertilisers, produce soil improvers and alternatives for peat based potting soil. The recovered fibres can even be converted to replace plant pots in the horticultural industries and can make an important contribution to meeting the EU's Renewable Energy Targets through their production of biogas.

The technology is already established and has been tested on an industrial scale, and there is no shortage of biowaste to process. Indeed, livestock intense areas are struggling to dispose of manure, and are often forced to transport it vast distances, further contributing to emissions. However biobased fertilisers still struggle to compete on a level playing field with synthetic mineral fertilisers.

There are several reasons for this. Firstly,organic materials are complex, and require costly technological processes to extract the nutrients, and are produced in smaller quantities than synthetic fertilisers. This makes them more expensive to produce and unable to compete at an economy of scale. There is also a problem of accessing the market as many fertiliser sales representatives do not stock the products. Thirdly, there is a misconception regarding biobased fertilisers – that they are agronomically inferior, or that they retain dangerous residues. However, pot and field trials have shown in many cases that this judgement is false. Many biobased fertilisers have worked equally when tested against their synthetic equivalents and have been shown to contain no harmful pathogens or increase nutrient emissions. They should be subject to the same stringent criteria as synthetic fertilisers, and once approved, provide a serious alternative for farmers.

The growth of the use of biobased fertilisers can support European farming to make great strides towards sustainability but the industry remains limited as investors are put off by the lack of growth in the sector. The SYSTEMIC project has proposed that recovered nutrients be taken under the EU Emissions Trading Scheme which would allow both the biogas plants recovering the nutrients, and the farmers using the recovered units, to access carbon credits based on the emissions saved. It would also incentivise fertiliser manufacturers to use recovered nutrients in their own processes. To help farmers better under the concept of biobased fertilisers, RISE with the project SYSTEMIC, has produced fact sheets for two commonly produced products, Mineral Concentrate from process manure or digestate, and Ammonium Sulphate Solution.

**For more information on the work of SYSTEMIC, please go to https://systemicproject.eu/ or follow SYSTEMIC on twitter at @systemic_eu**

SOILGUARD

# Sustainable soil management to unleash soil biodiversity potential and increase environmental, economic and social wellbeing

**Lindsey CHUBB, ELO**

On 21-22 June 2021, the Horizon 2020 project, SOILGUARD, held its inaugural meeting online, kicking off its project activities. Twenty-five transdisciplinary project partners from seventeen countries came together to share the project goals, expectations and results to be achieved during the next four years. Roles and responsibilities to be carried out were explained by Leitat, project coordinator, and the leaders of the different work packages.

**The aim of SOILGUARD is to boost the sustainable use of soil biodiversity to protect soil multifunctionality and increase economic, social and environmental wellbeing.** This will be achieved by co-creating strong evidence of the links between soil management, soil biodiversity, soil multifunctionality and human wellbeing across biogeographical regions.

**This evidence will be obtained by means of a holistic ground-breaking Soil Biodiversity and Wellbeing Framework.** SOILGUARD will assess soil biodiversity status and its contribution to the delivery and value of soil-mediated ecosystem services (ES) in relation to threats i.e. land degradation, unsustainable soil management and climate change. The evidence will be used to:

1. quantify the environmental, economic, and social benefits of sustainable soil management (SSM) and soil biodiversity,
2. increase the power to forecast soil biodiversity responses to ongoing and projected challenges, and cascading effects on soil-mediated ES and human wellbeing,
3. inform national, EU and global policy and conservation frameworks
4. **mainstream and support SSM practices implementation.**

If you are interested in learning more about SOILGUARD project developments, you can contact the ELO Projects Team (projects@elo.org) or follow us on social media.

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SOILGUARD Project

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# Diary dates

**31 October – 12 November, Glasgow**
UN Climate Change conference
**https://ukcop26.org/**

**30 November - 1 December, Brussels, online**
The Future of Food Conference 2021
**https://eitfutureoffood.eu/**

**30 November - 1 December**
European Business & Nature Summit 2021- scaling up business action for nature
**https://ec.europa.eu/environment/biodiversity/business/ebns/index_en.htm**

**1 December, Paris**
ELO General Assembly - **www.europeanlandowners.org**

**2 December, Paris**
Forum for the Future of Agriculture regional edition in France
**www.forumforagriculture.com**

**15 March 2022, Brussels**
Forum for the Future of Agriculture Annual Conference
**www.forumforagriculture.com**

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European Landowners' Organization

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