

Information package on 'Innovation in Agriculture' Public Hearing of 18 February 2020

Note

This information package is prepared by the Policy Department for Structural and Cohesion Policies for the hearing of 18 February 2020 organised by the European Parliament's Agricultural and Rural Development Committee (AGRI Committee). The main purpose of the paper is to facilitate the legislative work of MEPs related to the agri-food research & innovation issues.

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1 AGRI-FOOD SYSTEMS: GLOBAL TRENDS AND CHALLENGES

1.1 Overview of the key agri-food features (selected studies in chronological order)

- **European Commission (EC):** [EU Agricultural Outlook for markets and income 2019-2030](#) (December 2019)
- **FAO:** [The State of Food Security and Nutrition in the World 2019](#) (December 2019)
- **OECD - FAO:** [Agricultural Outlook 2019 - 2028](#) (December 2018)
- **FAO – European Commission - CIRAD:** [Food systems at risk . New trends and challenges](#) (October 2019)
- **Global Agricultural Productivity (GAP):** [2019 Global Agricultural Productivity Report - Productivity Growth for Sustainable Diets and more](#) (GAP Report), Virginia Tech (October 2019)
- **European Parliament:** [Research for AGRI Committee - Megatrends in the agri-food sector: global overview and possible policy response from an EU perspective](#) (September 2019)
- **Hoffmann Centre for Sustainable Resource Economy - Chatham House:** [Delivering Sustainable Food and Land Use Systems: The Role of International Trade](#) (September 2019)
- **Wageningen University & Research (WUR):** [Mansholt lecture 2019: The Future of Proteins](#) (September 2019)
- **The Food and Land Coalition (FOLU):** [Growing Better: Ten Critical Transitions to Transform Food and Land Use](#) (report) (September 2019)
- **World Resources Institute (WRI):** [Reducing Food Loss and Waste: Setting a Global Action Agenda](#) (World Resources report) (August 2019)
- **World Resources Institute (WRI):** [Creating a Sustainable Food Future - A Menu of Solutions to Feed Nearly 10 Billion People by 2050](#) (World Resources Report) (July 2019)
- **IEG Policy - Agribusiness Intelligence:** [Smart Solutions for Food and Farming: A Policy Perspective](#), Informa report (June 2019)
- **OECD:** [Policy priorities for the global food system](#), OECD Global Forum on Agriculture, Background brief (May 2019)
- **FiBL & IFOAM Organics International:** [The World of Organic Agriculture. Statistics and emerging trends in 2019](#) (February 2019)
- **Chatham House:** [Meat Analogues: Considerations for the EU](#) (February 2019)
- **OECD:** [Dynamic Changes and Effects of Agro-Food Global value chains \(GVCS\)](#) (January 2019)
- **The Lancet:** [Food in the Anthropocene: the EAT – Lancet Commission on healthy diets from sustainable food systems](#), EAT Lancet Commission report (January 2019)
- **IEG Vu – IEG Policy:** [7 Top Food Commodity Trends](#) (2019)
- **Serraj, R. & Pingali, P.** (Eds): [Agriculture & Food Systems to 2050. Global trends, Challenges and Opportunities](#), World Scientific Series in Grand Public Policy Challenges of the 21st Century (December 2018)
 - **MAGGIO, A., SCAPOLO, F., VAN CRIEKINGE, T. & SERRAJ, R.:** [Global Drivers and Megatrends in Agri-Food Systems](#). In book (Chapter 2): *Agriculture & Food Systems to 2050* (December 2018)
- **The Economist Intelligence Unit:** [Food Sustainability Index - Whitepaper 2018 - : Fixing food 2018: best practices towards the Sustainable Development Goals](#)
- **EC- Joint Research Centre (JRC):** [Territorial Facts and Trends in the EU Rural Areas within 2015-2030](#), JRC Technical Report (2018)
- **European Commission (EC):** [Economic challenges facing EU agriculture](#) (December 2017)
- **FAO :** [The future of food and agriculture - Trends and challenges](#) (2017)

- **EC - Joint Research Centre (JRC):** [Scenar 2030 - Pathways for the European agriculture and food sector beyond 2020, Summary Report \(2017\)](#)
- **EC - Joint Research Centre (JRC):** [Delivering on food safety and nutrition in 2050 – Future challenges and policy preparedness, JRC Science for policy report \(2016\)](#)

2 EU RESEARCH AND INNOVATION POLICY

2.1 European Commission priorities for 2019-2024

- [Political guidelines for the European Commission 2019-2024](#)
 - [Setting priorities - The European Semester autumn package 2020](#)
- [Commissioner Mariya Gabriel Blog - Innovation, Research, Culture, Education and Youth](#)
 - [President von der Leyen's mission letter to Mariya Gabriel](#)
 - [Mariya Gabriel's answers to the European Parliament questionnaire](#)
- [EPRS - Compendium of briefings - Parliamentary hearings of the Commissionersdesignate An analysis of the portfolios of the von der Leyen Commission \(November 2019\)](#)

2.2 EU Research & Innovation - General Issues

- [EC - Research and Innovation web page](#)
 - [The Innovation Principle](#)
 - [Better regulation toolbox 21 - research and innovation](#)
 - [BEUC: Precautionary principle under attack: please delete so-called 'Innovation Principle' from Horizon Europe research funding programme \(open letter\) \(2018\)](#)
- [RISE reports](#)
 - [RISE report \(2018\) - Europe's future - Open innovation, open science, open to the world : reflections of the Research Innovation and Science Policy Experts \(RISE\) High Level Groups](#)
 - [RISE report \(2019\) - 101 ideas on the future of research and innovation in Europe](#)
 - [RISE report \(2019\) - Final reflections of the RISE group](#)
- [EC Strategic Plan 2016-2020 - Research and Innovation](#)
 - [Annual activity report 2018 - Research and Innovation](#)
- [EPRS briefing: Research and innovation in the EU. Evolution, achievements, challenges \(November 2018\)](#)
- [REA - Research Executive Agency](#)
- [ERC - European Research Council](#)
- [EC News - EIC pilot phase - €2 billion to fast forward the creation of the European Innovation Council \(EIC\)](#)
- [EC - Cordis - EU research results](#)
 - [CORDIS Results packs](#)
- [EUROSTAT - Research and innovation statistics at regional level](#)
- [List of databases of EU-funded research and innovation projects](#)

2.3 Horizon 2020 (Framework programme 2014 - 2020)

- [Horizon 2020](#)
 - [What is Horizon 2020?](#)
 - [Official documents](#)
 - [Regulation \(EU\) No 1291/2013 - Framework Programme for Research & Innovation](#)
 - [Regulation \(EU\) 1290/2013 - Rules for participation](#)
 - [Council Decision - Specific Programme](#)

- [Horizon 2020 - Work Programme 2018-2020](#)
 - [Horizon 2020 sections](#)
 - [Food Security, Sustainable Agriculture and Forestry, Marine, Maritime and Inland Water Research and the Bioeconomy](#)
 - [Climate Action, Environment, Resource Efficiency and Raw Materials](#)
 - [Nanotechnologies, Advanced Materials, Advanced Manufacturing and Processing, and Biotechnology](#)
 - [Horizon 2020 areas](#)
 - [Agriculture and Forestry](#)
 - [Bio-based Industries](#)
 - [Biotechnology](#)
 - [Environment & Climate Action](#)
 - [Food & Healthy Diet](#)
- [ICT Research & Innovation](#)
- [Cordis - Horizon 2020 projects & results](#)
- [Horizon 2020 - Interim evaluations \(2017\)](#)
 - [Interim evaluation of Horizon 2020 - Climate action, environment, resource efficiency and raw materials \(study\) \(2017\)](#)
 - [EP Study - Horizon 2020 EU framework programme for research and innovation - European Implementation Assessment \(February 2017\)](#)
 - [EC Communication - Horizon 2020 interim evaluation: maximising the impact of EU research and innovation \(COM \(2018\) 2\)](#)
 - [EPRS briefing - Interim evaluation of Horizon 2020 \(March 2018\)](#)
 - [EC News - The last SC2 calls under Horizon 2020 receive 661 projects proposals \(January 2020\)](#)
- [Horizon scanning study: future radical innovation breakthroughs \(EC News\)](#)
 - [100 Radical Innovation Breakthroughs for the future - RIBs \(Foresight\) \(2019\)](#)

2.4 Horizon Europe (Framework programme 2021 - 2027)

- [EC News: Horizon Europe - the next research and innovation framework programme](#)
- [EC News - EU budget - Commission proposes most ambitious Research and Innovation Programme](#)
- [EC Communication - A renewed European Agenda for Research and Innovation - Europe's chance to shape its future \(COM \(2018\) 306\)](#)
- [Horizon Europe - Investing to shape our future](#)
 - [Presentation \(EN version\)](#)
 - [Horizon Europe - Fact Sheet](#)
 - [The Strategic Planning process and the Strategic Plan - Factsheet](#)
 - [EU budget Factsheet - EU funding for Research and Innovation 2021 - 2027](#)
- [The Commission's proposal for Horizon Europe](#)
 - [Proposal for a Regulation establishing Horizon Europe Framework \(COM \(2018\) 435\): text; annexes](#)
 - [EP Legislative Observatory - Horizon Europe framework programme for research and innovation 2021–2027](#)
 - [EPRS briefing - Horizon Europe Framework programme for research and innovation 2021–2027 \(May 2019\)](#)
 - [EPRS briefing - The Horizon Europe framework programme for research and innovation 2021-2027 \(November 2018\)](#)
 - [Proposal for a Decision on establishing the Specific Programme implementing Horizon Europe \(COM \(2018\) 436\): text; annexes](#)

- EP Legislative Observatory - Specific programme implementing Horizon Europe framework programme for research and innovation 2021–2027
 - EPRS briefing - Horizon Europe – Specific programme Implementing the framework programme (May 2019)
- Commission Staff Working document - Impact Assessment (SWD (2018) 307): [Part I](#); [Part II](#); [Part III](#); [Executive Summary](#)
- Commission Staff Working document - [Horizon Europe Stakeholder Consultation - Synopsis Report](#) (COM (2018) 309)
- Provisional agreement between Ep and Council on Horizon Europe (March - April 2019)
 - EC News - [Commission welcomes provisional agreement on Horizon Europe](#) (March 2019)
 - [European Parliament endorses the provisional agreement on Horizon 2020](#) (17 April 2019)
- [Orientations towards the first Strategic Plan for Horizon Europe](#) (December 2019)
 - [Web open consultation - Orientations towards the Implementation Strategy of the research and innovation framework programme Horizon Europe](#)
 - [Results of the Horizon Europe implementation co-design exercise: towards a sound implementation framework](#)
 - Transition of the ERC (European Research Council to Horizon Europe - [Operational Considerations](#) (December 2019)
 - EPRS briefing - [Establishing and implementing Horizon Europe](#) (April 2019)
 - [Studies and reports leading to the mission-oriented approach for Horizon Europe](#)
- [Missions in Horizon Europe](#)
 - Mission area: [Adaptation to climate change including societal transformation](#)
 - Mission area: [Climate-neutral and smart cities](#)
 - Mission area: [Soil health and food](#)

3 RESEARCH AND INNOVATION IN AGRICULTURE

3.1 Agri-research and innovation - General issues

- EC - [CAP Indicators](#) (2017 data available)
- EC - DG AGRI - [The Common Agricultural Policy: separating fact from fiction](#)
- EC - DG AGRI - [Research & Innovation](#)
 - EPRS briefing: [EU agricultural research and innovation](#) (January 2019)
- European Parliament: [Resolution of 7 June 2016 on technological solutions for sustainable agriculture in the EU](#)
 - [Resolution of 7 June 2016 on enhancing innovation and economic development in future European farm management](#)
 - [Resolution of 30 May 2018 on the future of food and farming](#)
- EC - Horizon 2020: [A strategic approach to EU agricultural research and innovation](#), Final paper (July 2016)
- EC - DG AGRI - [Horizon 2020 work programmes](#)
 - [Platforms & networks](#)
 - [AgriResearch factsheets outlining the implementation of the strategy and listing all on-going projects:](#)
 - [Animals and health](#)
 - [Animal production systems](#)
 - [Digital transformation in agriculture and rural areas](#)
 - [Ecological approaches and organic farming](#)
 - [Enhancing human capital and boosting innovation systems](#)
 - [EU agricultural research and innovation in a nutshell](#)

- Genetic resources and breeding
 - Plant health
 - Public goods from agriculture and forestry
 - Soils
 - Sustainable, circular and innovative and value chains
 - Understanding dynamics and modernising policies
 - Water, nutrients and waste
- EC - JRC: [Agricultural technological innovation](#)
- State of play of Research and innovation in agriculture - Selected papers:
 - **Ministère de l'Agriculture et de l'Alimentation - Centre d'Etudes et de Prospective (CEP)** : [Transformations sociétales et grandes tendances alimentaires](#), Document de travail n°13 (Février 2019)
 - **Conseil Economique, Social et Environmental (CESE France)**: [L'innovation en agriculture](#), Avis (Janvier 2019)
 - **EC - AgriResearch Conference** - Innovating for the future of farming and rural communities (May 2018)
 - [Conference report](#)
 - [Contributions & related documents](#)
 - **Gartner Consulting**: [5 Trends Emerge in the Gartner Hype Cycle for Emerging Technologies, 2018](#) (August 2018)
 - **Hersey P. and Fuglie K.**: [Agricultural research investment and policy reform in high-income countries](#), Economic research report No 249, ERS - USDA (May 2018)
 - **Détang-Dessendre, C., Geerling-Eiff, F., Guyomard, H. and Poppe, K.**: [EU Agriculture and innovation: What role for the CAP?](#), INRA and Wageningen University and Research (April 2018)
 - **Coca O., Ștefan G. and Mironiuc M.**: [Empirical evidences regarding the relationship between innovation and performance in the agriculture of the European Union](#), Scientific Papers: Management, Economic Engineering in Agriculture and Rural Development (2017)
 - **Harold van der Meulen, H., van Assesdonk, M. and Ge, L.**: [The state of innovation in European agriculture: Innovators are few and far between](#), Studies in Agricultural Economics (2016)

3.2 EIP AGRI - European Innovation Partnership for Agricultural Productivity and Sustainability

- [About EIP AGRI](#)
 - EC Communication on the [European Innovation Partnership 'Agricultural Productivity and Sustainability'](#) (COM (2012) 79)
 - [EIP AGRI - Horizon 2020 - Creating knowledge to boost agricultural innovation](#)
 - [Operational Groups](#)
 - [Multi-actio projects](#)
 - [Thematic Networks](#)
 - [Publications](#)
- [Focus groups](#)
 - Focus Group on [Agroforestry: introducing woody vegetation into specialised crop and livestock system](#)
 - Focus Group on [Bee health and sustainable beekeeping](#)
 - Focus Group on [Circular horticulture](#)
 - Focus Group on [Ecological Focus Areas](#)
 - Focus Group on [Enhancing production and use of renewable energy on the farm](#)
 - Focus Group on [Fertiliser efficiency](#)

- Focus Group on [Grazing for Carbon](#)
- Focus Group on [New forest practices and tools for adaptation and mitigation of climate change](#)
- Focus Group on [Mixed Farming Systems: Livestock/Cash crops](#)
- Focus Group on [Moving from source to sink in arable farming](#)
- Focus Group on [Organic farming - Optimising arable yields](#)
- Focus Group on [Profitability of Permanent Grassland: Starting Paper](#)
- Focus Group on [Protecting fruit production from frost damage](#)
- Focus Group on [Protecting agricultural soils from contamination](#)
- Focus Group on [Reducing emissions from cattle farming](#)
- Focus Group on [Reducing antimicrobial use in poultry farming](#)
- Focus Group on [Reducing food loss on the farm](#)
- Focus Group on [Soil organic matter content in Mediterranean regions](#)
- Focus Group on [Soil salinisation](#)
- Focus Group on [Sustainable mobilisation of forest biomass](#)
- Focus Group on [Water & agriculture: adaptive strategies at farm level](#)
- EC - DG AGRI - [European Innovation Partnership "Agricultural productivity and Sustainability" EIP-AGRI](#)
 - CAP - Rural Development Policy - [Guidelines on Programming for Innovation and the implementation of the EIP for agricultural productivity and sustainability \(Period 2014-2020\)](#)
 - **Coffey - SQW - And International - Edater - Spped:** [Evaluation study of the implementation of the European Innovation Partnership \(EIP\)](#), European Commission (November 2016)
- Other EU policies - [EU funding opportunities related to innovation in agriculture, food and forestry](#)

3.3 Agricultural Knowledge and Innovation Systems (AKIS)

- EC - DG AGRI - CAP reform - [Building stronger Agricultural Knowledge and Innovation Systems \(AKIS\) to foster advice, knowledge and innovation in agriculture and rural areas](#) (April 2019)
- Press News - Standing Committee on Agricultural Research (SCAR) - [Knowledge and innovation: unlocking the potential of food and farming](#) (September 2019)
 - [Preparing for future AKIS in Europe](#) (Fourth AKIS Report) (September 2019)
- EIP AGRI: [EIP-AGRI Brochure Agricultural Knowledge and Innovation Systems \(AKIS\)](#)

3.4 Farm Advisory System

- EC - DG AGRI - [Farm Advisory System](#)
- SCAR: [Future of Advisory Services](#) (Standing Committee on Agricultural Research - SCAR) (Policy brief) (2017)
- Selected paper: **Choices Magazine (AAEA):** Theme Overview: [The Future of Farm Management Extension](#) (2019)
 - Langemeier, M. and Schockely, J.: [Impact of Emerging Technology on Farm Management](#)

4 RESEARCH AND INNOVATION IN AGRICULTURE: SPECIFIC TOPICS

4.1 Research and Innovation for the ‘European Green Deal’ and the ‘Farm to Fork Strategy’ - General approach

- [What is the European Green Deal?](#)
 - [Communication - The European Green Deal \(COM \(2019\) 640\) Annex](#)
 - [European Green Deal and Biodiversity](#)
 - [European Green Deal and ‘From Farm to Fork Strategy’](#)
 - [Investing in a Climate-Neutral and Circular Economy](#)
 - [EC – Horizon: Genetic diversity maps to help forests survive climate change \(March 2019\)](#)
 - [Executive Vice President Timmermans’ remarks at the Conference on the first European Climate Law \(28 January 2020\)](#)
 - [An agenda for a climate-smart and sustainable food system for a healthy Europe \(report of the EC FOOD 2030 independent expert group - executive summary\)](#)
 - [Food strategies for green cities \(Newsletter\) \(2018\)](#)
 - [Food in cities: study on innovation for a sustainable and healthy production, delivery, and consumption of food in cities \(study\) \(2017\)](#)
- [Research and innovation for the European Green Deal](#)
 - [EEB: Letter on Innovation principle in the EU Green Deal](#)
- [Green research projects - Success stories](#)
- [European Environment Agency \(EEA\) - Greening Agriculture Policy](#)
 - [Small increase in EU’s total greenhouse gas emissions in 2017, with transport emissions up for the fourth consecutive year \(May 2019\)](#)
 - [EEA Report 09/2019 - Sustainability transitions: policy and practice](#)
 - [EEA Report 08/2019 - European Union emission inventory report 1990-2017](#)
 - [EEA report 6/2019 - Annual European Union greenhouse gas inventory 1990 – 2017 and inventory report 2019](#)
 - [EEA report No 4/2019 - Climate change adaptation in the agriculture sector in Europe \(September 2019\)](#)
- [Eurostat: Climate change - driving forces - agricultural emissions](#)
- [EC - JRC - Environment and climate change](#)
 - [Agricultural Biodiversity](#)
- [EIP AGRI: The European Green Deal](#)
 - [Agriculture and climate change - Focus Groups](#)
- [CORDIS - Results Packs](#)
 - [Pathways to sustainability: A better relationship between the planet and its people](#)
 - [Biodiversity and ecosystem services: Protecting the planet's ecological resources](#)
- [Selected papers \(in chronological order\):](#)
 - [Vallecillo, S. et al.: How ecosystem services are changing: an accounting application at the EU level, *Ecosystem Services* \(paper\) \(December 2019\)](#)
 - [OECD: Enhancing Climate Change Mitigation through Agriculture \(report\) \(October 2019\)](#)
 - [OECD Statistics - Greenhouse gas emissions \(LULUCF excluded\)](#)
 - [Van der Ploeg et al.: The economic potential of agroecology: Empirical evidence from Europe, *Journal of Rural Studies* \(paper\) \(October 2019\)](#)

- **Rega, C. et al.:** Environmentalism and localism in agricultural and land-use policies can maintain food production while supporting biodiversity. Findings from simulations of contrasting scenarios in the EU, *Land Use Policy* (paper) (September 2019)
- **OKO Institut:** EU Environment and Climate Change Policies - State of play, current and future challenges (study), Research for ENVI Committee, European Parliament (September 2019)
- **Intergovernmental Panel on Climate Change (IPCC):** Land is a Critical Resource, IPCC report says (August 2019)
 - Press release
 - Climate change and land (Special report – August 2019)
 - Report's content
 - Leaflet
- **Brent, K. F. et al.:** Country-specific dietary shifts to mitigate climate and water crises, *Global Environmental Change* (paper) (August 2019)
- **EC - JRC:** An economic assessment of GHG mitigation policy options for EU agriculture (Report) (July 2019)
- **Philippidis, G. et al.:** Waste not, want not: A bio-economic impact assessment of household food waste reductions in the EU, *Resources, Conservation and Recycling* (paper) (July 2019)
- **EC – JRC:** Assessing the greenhouse gas impact of forest management activities in EU countries (June 2019)
- **Oréade Brèche - IEEP:** Evaluation of the CAP on climate change and greenhouse gas emissions, Final Report, European Commission (May 2019)
- **Kay, S. et al.:** Agroforestry creates carbon sinks whilst enhancing the environment in agricultural landscapes in Europe, *Land Use Policy* (paper) (April 2019)
- **Kay, S. et al.:** Agroforestry is paying off – Economic evaluation of ecosystem services in European landscapes with and without agroforestry systems, *Ecosystem Services* (paper) (April 2019)
- **IEEP:** Net-zero agriculture in 2050: how to get there?, Report (February 2019)
- **PNAS (Proceedings of the National Academy of Sciences of US):** Aligning research with policy and practice for sustainable agricultural land systems in Europe (paper) (2019)
- **Alliance Environment:** Evaluation study of the impact of the CAP on climate change and greenhouse gas emissions (Final Report), European Commission (October 2018)
- **IEEP:** The consequences of climate change for EU agriculture: follow-up to the COP21 UN Paris Climate Change Conference, Research for AGRI Committee, European Parliament (February 2017)

4.2 Research and Innovation on biodiversity

- **FAO:** Biodiversity for Food and Agriculture
 - The State of the World's Biodiversity for Food & Agriculture (2019)
- **IPBES:** Global Assessment Report on Biodiversity and Ecosystem Services (Report) (2019)
- **European Union:**
 - **EC:** Biodiversity Strategy
 - **EC - JRC:** Ecosystems and biodiversity
 - **Eurostat:** Biodiversity statistics
 - **European Court of Auditors (ECA):** Audit preview: Biodiversity in farming (May 2019)
- **Selected papers (in chronological order):**
 - **PNAS (Proceedings of the National Academy of Sciences of US):** Increasing crop heterogeneity enhances multitrophic diversity across agricultural regions (August 2019)
 - **Crenna, E., Sinkko, T. and Sala, S.:** Biodiversity impacts due to food consumption in Europe, *Journal of Cleaner Production* (paper) (August 2019)

- **World Economic Forum:** To feed 10 billion people, we must preserve biodiversity. Here's how (July 2019)

4.3 Research and Innovation on bioeconomy / circular economy

- European Commission
 - [The added value of a food systems approach in research and innovation](#) (Policy brief)
 - [Synthesis of existing food systems studies and research projects in Europe](#) (study) (2019)
 - [Top 20 innovative bio-based products](#) (study) (2019)
 - [Bio-based products. From idea to market '15 success stories'](#) (study) (2019)
 - [Environmental impact assessments of innovative bio-based products](#) (study) (2019)
 - [Research & Innovation Projects relevant to the Circular Economy Strategy](#) (2016 - 2018 study) (2019)
 - Workshop on "Best practices in integrating primary production (farmers and forest owners) in the Bioeconomy (BE) value chains and boosting the development of the Bioeconomy (BE) in rural areas" (report) (September 2018)
- [CORDIS Results Pack - Bio-based innovation builds Europe's bioeconomy](#)
- EC - JRC: [Green and Circular Economy](#)
- EC- ENRD: [Mainstreaming the bioeconomy](#) (EU Rural Review No 28, August 2019)
- [Publications database](#) on Bioeconomy

4.4 Research and Innovation on digital / precision agriculture

- European Commission: general issues
 - [Digital Single Market](#)
 - [Commission's priorities: A Europe Fit for the Digital Age](#)
 - [5G for Europe Action Plan](#)
 - [The European AI Alliance](#)
 - [Pan-European network of Digital Innovation Hubs \(DIHs\)](#)
 - [European Broadband Competence Offices Network](#)
 - [Copernicus. Europe's eyes of Earth](#)
 - [Galileo](#)
- European Parliament: [Digital Transformation](#), EPRS briefing (June 2019)
- European Commission : digital and precision farming
 - [A smart and sustainable digital future for European agriculture and rural areas](#) (Declaration signed by 26 Member States) (April 2019)
 - [Connectivity is essential for precision farming](#) (Video) (January 2019)
 - [CORDIS Results Pack - Precision Farming: Sowing the seeds of a new agricultural revolution](#)
 - EIP - AGRI: [Precision farming](#)
 - [Smart farming thematic network](#)
 - [Smart farming technologies and new job opportunities in rural areas](#)
- European Court of Auditors (ECA): [Audit preview: New imaging technologies for agricultural monitoring](#) (August 2019)
- Selected papers (in chronological order)
 - **OECD:** [Digital Opportunities for Better Agricultural Policies](#) (September 2019)
 - **ING:** [Food tech: Technology in the food industry](#) (April 2019)
 - **VVA - WR:** [Impacts of the digital economy on the food chain and the CAP](#), Research for AGRI Committee, European Parliament (February 2019)
 - **CEPS - BCFN:** [Digitising Agri-food – Pathways and Challenges](#) (2019)
 - **COPA – COGECA:** [EU Code of Conduct in agricultural data sharing by contractual agreement](#) (2018)

- **IHS Markit: Broadband Coverage in Europe 2017**, Final Report for the EC (July 2018)
- **VetEffecT - Wageningen UR: Precision agriculture and the future of farming in Europe**, European Parliament, STOA study (December 2016)

4.5 Research and Innovation on water and agriculture

- EC: [EU water policy](#)
 - [Water & CAP](#)
 - [Sustainability at the water source](#) (March 2019)
 - [EIP Water: Newsletter](#)
 - European Environment Agency (EEA): [Water for Agriculture](#)
- OECD: [Water and agriculture](#)
 - [Navigating pathways to reform water policies in agriculture](#), report (March 2019)
- The World Bank: [Water in agriculture](#)
- FAO: [AQUASTAT - FAO's Global Information System on Water and Agriculture](#)

4.6 Research and Innovation on soil protection

- EC - DG AGRI: [Soil matters for our future](#)
 - [CAP specific objective: Efficient Soil Management](#) (Brief 5)
 - [EIP - AGRI Brochure Soil organic matter matters](#)
 - [EC Roadmap - EU Farm policy – Impact on sustainable management of the soil](#) (Staff working document) (2019)
 - [AGRI Research Factsheet - Soils](#)
- EC - DG ENVI: [Soil](#)
 - [The Soil Thematic Strategy](#)
 - [Studies and publications on soils](#)
- European Environment Agency (EEA): [EEA Signals 2019 – Land and soil in Europe](#) (September 2019)
 - [Protecting Europe's land and soil resources is fundamental for a sustainable future](#) (December 2019)
- EC - JRC: [Soil](#)
- Mega: [Soil-less farming: the future of agriculture](#)

4.7 Research and Innovation on plant health

- European Commission
 - [Plants](#)
 - [EU Plant Health legislation](#)
 - [Pesticides in agriculture](#)
 - [Plants - Pesticides](#)
 - [Sustainable use of pesticides](#)
 - [Biocides](#)
 - [Endocrine disruptors](#)
 - [Priority substances under the Water Framework Directive](#)
- EC-JRC: [Information Platform for Chemical Monitoring](#)
- [CORDIS Results Pack - Plant health: Protecting plants to safeguard our future](#)
- European Environment Agency (EEA): [Chemicals](#)
- Eurostat: [Agri-environmental indicators - fact sheets](#)
 - [Eurostat - Agri-environmental indicators - consumption of pesticides](#)
- European Court of Justice: [Case 616/17 of 1 October 2019 - Precautionary principle - Definition of the concept of 'active substance' - Pesticides - Glyphosate](#)

4.8 Research and Innovation on new plant breeding techniques

- EC: New Techniques Working Group [Final report](#)
- European Court of Justice : [Judgement in Case 528/16 of 25 July 2018](#). New techniques/methods of mutagenesis. [Press release](#)
 - Nature Research Journal: [CRISPR conundrum: Strict European court ruling leaves food-testing labs without a plan](#) (July 2019)
- OECD: [OECD work on biotechnology](#) (December 2018)
- Atanasova, A. & Keiper, F.: [Plant breeding innovation: A global regulatory perspective](#), *Cereal Chemistry*, (January/February 2018)
- Dutch Government: [Proposal for discussion on actions to improve the exemption mechanism for genetically modified plants under Directive 2001/18/EC](#), (September 2017)
- EC's High Level Scientific Advice Mechanism (SAM): ['Explanatory Note on New techniques in Agricultural Biotechnology'](#), European Technology Platform EC Press release (April 2017)
- EcoNexus: [Genetic Engineering in Plants and the 'New Breeding Techniques \(NBTs\)' - Inherent risks and the need to regulate](#), Briefing (December 2015)
- EASAC: [New breeding techniques](#), Statement (July 2015)
- European Parliament: [European Parliament Resolution of 24 January 2014](#) on 'plant breeding: what options to increase quality and yields?'
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Further information

This briefing is available at: <http://bit.ly/38hiVhV>

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