

## - Curriculum vitae -

### Stéphane Lemarié

#### Laboratoire d'Economie Appliquée de Grenoble (GAEL)

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**Research fields:** industrial organization, economics of innovation, agricultural economics  
**Expertise:** seed and pesticide industries, agricultural biotechnology, seed regulation

#### Education

2007 : Habilitation à Diriger les Recherches, University of Grenoble  
1995 : PhD in Economics, University of Grenoble  
1992 : M. Sc., Economics, University of Grenoble  
1991 : M. Sc., Plant genetics, and Engineer in Agronomy, AgroParisTech  
1991 : Engineer in Agronomy, AgroParisTech, Paris

#### Current position

2008- : Senior researcher, INRAE, Grenoble  
2021- : Deputy head of the Economics and Social Sciences division at INRAE  
(<https://www.inrae.fr/en/divisions/ecosocio>)

#### Previous positions

2012-2019 : Director of GAEL research unit (<https://gael.univ-grenoble-alpes.fr>)  
2010-2014 : Expert in economics for the French Haut Conseil des Biotechnologies (HCB-CEES)  
2004-2011 : Deputy director of GAEL  
1996-2008 : Junior researcher, INRA, Grenoble  
1997-1998 : Post-doc, Yale University

#### Editorial involvement

2021- : Associate editor *Economie Rurale*  
2019- : Associate editor *Review of Agricultural, Food and Environmental Studies*

#### Publications in economic in refereed journals

Couture, S., Lemarié, S., Teyssier, S. and Toquebeuf P. (2024) "The value of information under ambiguity: a theoretical and experimental study on pest management in agriculture". vol 96, num 1, pp. 19-47. *Theory and Decision*. DOI : 10.1007/s11238-023-09942-y

Fugeray-Scarbel, A., Irz, X., and Lemarié, S. (2023). Innovation in forest tree genetics: A comparative economic analysis in the European context. *Forest Policy and Economics*, 155, 103030. DOI : 10.1016/j.forpol.2023.103030

- Lemarié, S. and Marette, S. (2022). "The socio-economic factors affecting the emergence and impacts of new genomic techniques in agriculture: A scoping review". *Trends in Food Science & Technology*. Vol. 129, pp. 38-48. DOI : 10.1016/j.tifs.2022.07.013
- Labarthe, P., Coléno, F., Enjalbert, J., Fugerey-Scarbel, A., Hannachi, M. and Lemarié, S. (2021) "Exploration, exploitation and environmental innovation in agriculture. The case of variety mixture in France and Denmark". *Technological Forecasting and Social Change*. Vol. 172, 121028. DOI : 10.1016/j.techfore.2021.121028
- Lemarié, S., Orozco, V., Butault, J.P., Musolesi, A., Simioni, M. and Schmitt, B. (2020) "Assessing the long-term impact of agricultural research on productivity: Evidence from France". *European Review of Agricultural Economics*. vol. 47, num 4, pp. 1559-1586. DOI : 10.1093/euragg/jbz051
- Lemarié, S and Marcoul, P. (2018) "Coordination and information sharing about pest resistance." *Journal of Environmental Economics and Management*. vol. 87, pp. 135-149. DOI : 10.1016/j.jeem.2017.05.009
- Lemarié S, Baghdasaryan, D and Campens, E. (2017) "The product line strategy of a company selling seed with a licenced GM trait." *Journal of Agricultural & Food Industrial Organization*. vol. 15. DOI : 10.1515/jafio-2016-0030
- Joly, P.-B., Colinet, L., Gaunand, A., Lemarié, S., Larédo, P. and Matt, M. (2015). "L'évaluation peut-elle améliorer l'impact de la recherche ? L'approche ASIRPA", *Gérer et Comprendre*, num 122. <https://www.annales.org/gc/2015/gc122/GC-122-Article-JOLY.pdf>
- Joly, P.-B., Gaunand, A., Colinet L., Larédo, P., Lemarié, S., and Matt, M. (2015) "ASIRPA: A comprehensive theory-based approach to assessing the societal impacts of a research organization", *Research Evaluation*, vol. 24, num 4, pp. 440-453. DOI : 10.1093/reseval/rvv015
- Fadhuile, A., Lemarié, S. and Pirotte, A. (2015). "Disaggregating the Demand for Pesticides: Does it Matter?", *Canadian Journal of Agricultural Economics*, vol. 64, num 2, pp. 223-252. DOI : 10.1111/cjag.12070.
- Gaunand, A., Matt, M., Lemarié, S. Hocdé, A. and de Turckheim, E. (2015) "How does public agricultural research impact society?", *Research Policy*, vol. 44, num 4, pp. 849-861. DOI : 10.1016/j.respol.2015.01.009
- Bonroy, O., Lemarié, S. and Tropeano, J.P. (2013). "Credence Goods, Experts and Risk Aversion", *Economics Letters*, vol. 120, num 3, pp. 464-467. DOI : 10.1016/j.econlet.2013.05.033
- Bonroy, O. and Lemarié, S. (2012). "Downstream labeling and upstream price competition", *European Economic Review*, vol. 56, num 3, pp. 347-360. DOI : 10.1016/j.euroecorev.2011.10.003
- Aujas, P., Lacroix, A., Lemarié, S. and Reau, R. (2011). "Réduire l'usage des pesticides : un défi pour le conseil aux agriculteurs", *Economie Rurale*, num 324, pp. 18-33. DOI : 10.4000/economierurale.3071
- Ambec, S., C. Langinier and Lemarié, S. (2008), "Incentives to reduce crop trait durability", *American Journal of Agricultural Economics*, vol 90, num 2, pp. 379-391. DOI : 10.1111/j.1467-8276.2007.01110.x
- Bourguet, D., M. Desquilbet and Lemarié, S. (2005). "Regulating insect resistance management: the case of non- Bt corn refuges in the US", *Journal of Environmental Management*, vol 76, num 3, pp. 210-220. DOI : 10.1016/j.jenvman.2005.01.019
- Lemarié, S. (2003). "Evolution des structures industrielles et de la concurrence dans les secteurs des semences et des pesticides", *Economie Rurale*, num 277-278, pp. 167-182. DOI : 10.3406/ecoru.2003.5445

- Mangematin, V., S. Lemarié, J.-P. Boissin, D. Catherine, F. Corolleur, R. Coronini and Trommetter, M. (2003). "Development of SMEs and heterogeneity of trajectories: the case of biotechnology in France." *Research Policy*, vol 32, num 4, pp. 621-638. (published also in Mc Kelvey, M. and Orsenigo, L., (eds.) *The economics of biotechnology*. Cheltenham (GBR): E. Elgar) DOI : 10.1016/S0048-7333(02)00045-8
- Joly, P.-B. and Lemarié, S. (2002). "The technological trajectories of the agrochemical industry: change and continuity", *Science and Public Policy*, vol 29, num 4, pp. 259-266. DOI : 10.3152/147154302781780921
- Assouline, G., Joly, P.B., and Lemarié, S. (2002).- "Plant biotechnology and agricultural supply industry restructuring", *International Journal of Biotechnology*, vol. 4, num 2-3, pp. 194-210. DOI : 10.1504/IJBT.2002.000188
- Lemarié, S., V. Mangematin and Torre, A. (2001). "Is the creation and the development of biotech SMEs localised? Conclusions drawn from the French case", *Small Business Economics*, vol 17, num 1-2, pp. 61-76. DOI : 10.1023/A:1011197616151
- Lemarié, S. (2001). "How will US-based companies make it in Europe? An insight from the Pioneer and Monsanto", *AgBioForum*, vol 4, num 1, pp. 74-78.
- Mangematin, V., S. Lemarié and Catherine, D. (2001). "French Ag-Biotech SMEs: development prospects", *AgBioForum*, vol 4, num 2, pp. 98-104.
- Lemarié, S. (2000). "L'influence de la diffusion et de la différenciation des produits sur la dynamique des parts de marché : une application au marché français des semences de maïs", *Economie et Prévision*, num 145, pp. 41-51. DOI : 10.3406/ecop.2000.6111
- Joly, P.-B. and Lemarié, S. (2000). "50 ans d'innovations en agriculture : quelques enseignements des approches socio-économiques", *Economie Rurale*, num 255-256, pp. 86-97. DOI : 10.3406/ecoru.2000.5159
- Lemarié, S., De Looze, M.-A. and Mangematin, V. (2000). "Strategies of european SME's in Biotechnology: the role of size, technology and market", *Scientometrics*, vol 47, num 3, pp. 541-560. DOI : 10.1023/A:1005624017982
- Joly, P.-B., Lemarié, S. and Mangematin, V. (1998). "Coordination et incitations dans les contrats de recherche : le cas des accords public / privé", *Revue Economique*, vol 49, num 4, pp. 1129-1149. DOI : 10.3406/reco.1998.410034
- Joly, P.-B. and Lemarié, S. (1998). "Industry consolidation, public attitude and the future of plant biotechnology in Europe", *AgBioForum*, vol 1, num 2, pp. 85-90.
- Joly, P.-B. and Lemarié, S. (1996). "Innovation et dynamique des interactions marchandes : apport spécifique des approches évolutionnistes", *Economie Appliquée*, tome L, num 3, pp. 281-305.
- Lemarié, S. (1995). "Recherche publique et dynamique industrielle : une illustration à partir d'un modèle évolutionniste appliqué au secteur des semences", *Cahiers d'Economie et Sociologie Rurales*, num 37, pp. 115-148. DOI : 10.3406/reae.1995.1479
- Joly, P.-B. and Lemarié, S. (1993). "Comportements mimétiques et différenciation dans les phases de création de technologie", *Revue Internationale de Systémique*, vol 7, num 5, pp. 533-552.

### **Multidisciplinary publication in academic journals**

- Fugeray-Scarbel, A., Bouffier, L., Lemarié, S., Sánchez, L., Alia, R., Biselli, C., Buiteveld, J., Carra, A., Cattivelli, L., Dowkiw, A., Fontes, L., Fricano, A., Gion, J., Grima-Pettenati, J., Helmersson, A., Lario, F., Leal, L., Mutke, S., Nervo, G., ... Haapanen, M. (2024). Prospects for evolution in European tree breeding. *iForest - Biogeosciences and Forestry*, 17(2), 45–58. DOI : 10.3832/ifor4544-017

- Fugeray-Scarbel, A., Lemarié, S., Bernier, F., Raffin, A., & Bouffier, L. (2024). Evaluation of breeding cost in the French maritime pine breeding program and perspectives for alternative strategies using molecular markers. *Canadian Journal of Forest Research*, DOI : 10.1139/cjfr-2023-0125
- Nogué, F., Causse, M., Debaeke, P., Déjardin, A., Lemarié, S., Richard, G., Rogowsky, P., & Caranta, C. (2024). Can genome editing help transitioning to agroecology? *iScience*. DOI : 10.1016/j.isci.2024.109159
- Stetkiewicz, S., Menary, J., Nair, A., Rufino, M., Fischer, A. R. H., Cornelissen, M., ... & Davies, J. A. C. (2023). "Food system actor perspectives on future-proofing European food systems through plant breeding". *Scientific Reports*, vol 13, 5444. DOI : 10.1038/s41598-023-32207-1
- Stetkiewicz, S., Menary, J., Nair, A., Rufino, M. C., Fischer, A. R., Cornelissen, M., ... and Davies, J. A. (2023). "Crop improvements for future - proofing European food systems: A focus - group - driven analysis of agricultural production stakeholder priorities and viewpoints". *Food and Energy Security*, vol 12, e362. DOI : 10.1002/fes3.362
- Vialatte, A., Tibi, A., Alignier, A., Angeon, V., Bedoussac, L., Bohan, D. A., ... and Martinet, V. (2021). "Promoting crop pest control by plant diversification in agricultural landscapes: A conceptual framework for analysing feedback loops between agro-ecological and socio-economic effects". *Advances in Ecological Research*, vol. 65, pp. 133-165. DOI : 10.1016/bs.aecr.2021.10.004
- Ben-Sadoun, S., Fugeray-Scarbel, A., Auzanneau, J., Charmet, G., Lemarié, S., & Bouchet, S. (2021). Integration of genomic selection into winter-type bread wheat breeding schemes: a simulation pipeline including economic constraints. *Crop Breeding, Genetics and Genomics*, 3(3). DOI : 10.20900/cbagg20210008.
- R2D2 Consortium, Fugeray-Scarbel A., Bastien C., Dupont-Nivet M. and Lemarié S. (2021) " Why and How to Switch to Genomic Selection: Lessons From Plant and Animal Breeding Experience". *Frontiers in Genetics*, vol. 12, p. 1185. DOI : 10.3389/fgene.2021.629737
- Shumbusho, F., Raoul, J. Astruc, J.M., Palhiere, I. Lemarié, S. Fugeray-Scarbel, A. and Elsen, J.M. (2015) "Economic evaluation of genomic selection in small ruminants: a sheep meat breeding program". *Animal: an international journal of animal bioscience*, vol. 10, num 06, pp. 1033-1041. DOI : 10.1017/S1751731115002049
- Vacher, C., D. Bourguet, M. Desquilbet, S. Lemarié, S. Ambec and Hochberg, M. (2006). "Fees or refuges: which is better for the sustainable management of insect resistance to transgenic Bt corn?", *Biology Letters*, vol 2, num 2, pp. 198-202. DOI : 10.1098/rsbl.2005.0418
- Pietravalle, S., S. Lemarié and van den Bosch, F. (2006). "Durability of resistance and cost of virulence", *European Journal of Plant Pathology*, vol 114, num 1, pp. 107-116. DOI : 10.1007/s10658-005-3479-7
- Moreau, L., S. Lemarié, A. Charcosset and Gallais, A. (2000). "Economic efficiency of one cycle of Marker-Assisted Selection", *Crop Science*, vol 40, num 2, 329-337. DOI : 10.2135/cropsci2000.402329x

### **Non-academic publications**

- Charbonnier E, Fugeray-Scarbel A and Lemarié S (2019) "Rapeseed: how to value varieties with higher nitrogen use efficiency in France" *OCL*. vol 26. DOI : 10.1051/ocl/2019021
- Labarthe P., Coléno F., Fugeray-Scarbel A., Hannachi M. and Lemarié S. (2018) "Freins et leviers socio-économiques à la diffusion des mélanges variétaux pour la production de blé. Une comparaison entre France et Danemark" *Notes et études socio-économiques*, num 43, pp. 77-103.

- Perronne R., Hannachi M., Lemarié S., Fugerey-Scarbel A. and Goldringer I. (2016) "L'évolution de la filière blé tendre en France entre 1980 et 2006 : quelle influence sur la diversité cultivée ?". *Notes et études socio-économiques*, num 41, pp. 83-113.
- Fugerey-Scarbel A and Lemarié S. (2016) "[Industrie des semences] Un marché complètement modifié". *La Recherche*. num. 512, pp. 89-90.
- Fugerey-Scarbel, A. and Lemarié, S. (2015) "Les aspects économiques de la sélection génomique chez les plantes", *le Sélectionneur Français*, num. 66, pp. 55-68.
- Fugerey-Scarbel, A. and Lemarié, S. (2013) "Evolution de l'organisation de la recherche et du secteur des semences", *Le Sélectionneur Français*, num 64.
- Latruffe, L., Nauges, C., Allaire, G., Cahuzac, E., Garapin, A. and Lemarié, S. (2013). "Freins et incitations au développement de l'agriculture biologique en France" *INRA Sciences Sociales*, n° 4 - Octobre, 4 pages.
- Lemarié S. (2009) "Les variétés hybrides vues par un économiste", *Le Sélectionneur Français*, num. 60, pp. 101-108.
- Ambec, S. and Lemarié, S. (2006). "L'impact économique des innovations agricoles : l'arbitrage entre hybrides et lignées dans le secteur des semences", *INRA Sciences Sociales*, n° 5-6.
- Lemarié, S. (2006). "Economie du secteur semencier au niveau international : échanges marchands, stratégies des firmes et du secteur public", *Dossiers de l'Environnement de l'INRA*, num 30, pp. 65-77.
- Lemarié, S. (2001). "Diffusion des OGM et impact pour les agriculteurs : quels sont les liens ?", *OCL*, vol 8, num 3, pp. 204-210. DOI : 10.1051/ocl.2001.0204

## Book

- Lemarié S. (coord.), Fugerey-Scarbel A. (coord.), Caffier D., Lelièvre A., Mathieu J., Pouzet A. (2014), "Impact des OGM sur les exploitations agricoles". La Documentation Française / Haut Conseil des Biotechnologies, 337 p.

## Book chapters

- Fugerey-Scarbel A., Ben-Sadoun S., Bouchet S. and Lemarié, S. (2022). "Analyzing the Economic Effectiveness of Genomic Selection Genomic selection (GS) Relative to Conventional Breeding Approaches". In Ahmadi, N. and Bartholomé J. (eds) *Genomic Prediction of Complex Traits: Methods and Protocols*. New York, Springer. pp. 619-644. DOI : 10.1007/978-1-0716-2205-6\_22
- Fugerey-Scarbel A., Labatut J., Lemarié S. and Trommetter M. (2020) "Modèles économiques et formes d'organisation de l'amélioration génétique animale". In Verrier E., Milan D., and Rogel-Gaillard C. (eds) *Génétique des animaux d'élevage - Diversité et adaptation dans un monde changeant*. Versailles, éditions QUAE. pp. 225-240.
- Colinet, L., Gaunand, A., Hocdé, A., Joly, P.B., Lemarié, S., Matt, M. and Laredo, P. (2013). "Une approche multidimensionnelle de la mesure des effets de la recherche publique agronomique : le cas de l'INRA", In Glassey, O., Leresche, J.P. and Moeschler, O. (eds) *Penser la valeur d'usage des sciences*. Paris, Ed. des Archives contemporaines, pp. 49-76.
- Lemarié, S. and Marette, S. (2003). "Substitution and complementarities in the biotechnology and pesticide markets: toward a theoretical framework", in Kalaitzandonakes, N. (ed). *Economic and environmental impacts of agbiotech: a global perspective*. New York, Kluwer-Plenum, pp. 287-305. DOI : 10.1007/978-1-4615-0177-0\_15

- Corolleur, F., Mangematin, V., Torre, A. and Lemarié, S. (2003). "French biotech start-ups and biotech clusters in France: the importance of geographic proximity", in G. Fuchs and Luib, B. (eds) *Biotechnology in comparative perspective: growth and regional concentration*. Londres, Routledge. pp. 124-142.
- Lemarié, S. (2000). "Comparing allocation of resources in public and private research", in V. Santaniello, R. E. Evenson and Zilberman, D. (eds) *Agriculture and intellectual property rights: economic, institutional and implementation issues in biotechnology*. Wallingford, CABI, pp. 155-168.
- Evenson, R. E. and Lemarié, S. (1998). "Crop breeding models and implications for valuing genetic resources", in Smale, M. (ed) *Farmers, gene banks, and crop breeding: economic analyses of diversity in Wheat, Maize, and Rice*. Dordrecht (NL), Kluwer Academic Publishers and CIMMYT, pp. 79-92.

### Thesis supervised

- Benaissa Larby "*Politiques publiques pour favoriser la diversification de l'offre de semences en agriculture*" (started in feb. 2023)
- Sébastien Parenty "*Quelle organisation globale de l'amélioration des plantes pour favoriser une diversification des cultures ?*". (defended in nov. 2018)
- Joël Aka-N'Dri : "*Trois essais sur l'impact économique de la procédure d'autorisation de mise sur le marché des produits phytosanitaires en Europe*" (defended in nov. 2014)
- Adélaïde Fadhuile : "*Concurrence et Différenciation des Produits sur le Marché des Pesticides : Une Analyse Empirique sur Données Françaises*" (co-supervised with Alain Pirotte, Univ. Paris 2, defended in march 2014).
- Idyle Abdourahman-Djama : "*La sélection participative : un modèle alternatif d'innovation environnementale en agriculture. Trois essais en économie*" (defended in Oct. 2013)

### Research grants

- DIVEDIT - Promoting AgrobioDiversity through genome EDITing (2023-2028) - (55K€ for participation to one task). Research priority equipments and programs (PEPR) on Advanced Plant Breeding.
- BELIS - *Breeding European Legumes for Increased Sustainability* (2023-2028) – Leader of two tasks (85K€ for participation to three tasks) - EU project (IA Horizon).
- DATA4FOOD2030 (<https://data4food2030.eu/>) - *Pathways towards a fair, inclusive and innovative Data Economy for Sustainable Food Systems* (2022-) - (55K€ for participation to one task) – EU project (RIA Horizon).
- CoEDiTag - *Coevolution of Equipment, Digital Technologies (EDiT) and Agroecological models* (2023-) - Leader of the Workpackage 4 "Public policies favoring EDiTs" (65K€ for participation to one task) – Research priority equipments and programs (PEPR) on Agroecology and ICT.
- COMBINE - *Combining varieties to control plant pathogen populations: How to solve the efficiency / sustainability / technical- and cost-effectiveness trade-off?* - Leader of the Workpackage 2 "Analyzing socio-economic constraints and levers for developing diversification strategies" (53K€ for participation to this WP) – Agence Nationale de la Recherche.
- FAST (<https://sites.google.com/view/ppr-fast-project/home>) - *Facilitate public Action to exit from peSTicides (2021-2026)* - Participation to one task (65K€) - Priority Research Program Growing and Protecting crops Differently (PPR-CPA).

Mobidiv (<https://www6.inrae.fr/mobidiv/>) - *Mobilizing and Breeding Intra and inter-specific crop Diversity for a systemic change towards pesticide-free agriculture (2021-2026)* – Leader of the Workpackage 5 "Tools, strategies and policies for diversification" (100K€ for the two tasks in economics) - Priority Research Program Growing and Protecting crops Differently (PPR-CPA).

B4EST (<http://b4est.eu/>) - *Adaptive BREEDING for productive, sustainable and resilient FORESTS under climate change (2018-2022)* - Leader of one of the economic task (100K€) - H2020 EU project. grant agreement No 772283.

BREEDWHEAT ([www.breedwheat.fr](http://www.breedwheat.fr)) - *Genomic selection for Wheat (2012-2020)* - Leader of the economic task (150K€) - Program "Biotechnologies and Bioresources" for the "Investments for the future" initiative of the French government.

RAPSODYN ([www.rapsodyn.fr](http://www.rapsodyn.fr)) - *Optimisation of the RAPeSeed Oil content and Yield under low Nitrogen input: improving breeding of adapted varieties using genetics and genomics (2013-2020)* - Leader of the economic task (150K€) - "Biotechnologies and Bioresources" proposal for the "Investments for the future" initiative of the French government.

PEAMUST (<https://www.peamust-project.fr/>) - *Pea Multi-Stress adaptation and biological regulations for yield improvement and stability (2013-2020)* - Leader of the economic task (50K€) - "Biotechnologies and Bioresources" proposal for the "Investments for the future" initiative of the French government.

R2D2 - *Genetical, statistical and economic efficiency of genomic selection (2013-2018)* - Co-leader (25K€ per year) - Genomic Selection Metaprogramme of INRA.

WHEATAMIX (<http://www6.inra.fr/wheatamix/>) - *Increasing within-field wheat diversity to foster the multifunctionality and sustainability of wheat (2013-2016)* - Leader of the economic workpackage (15K€) - "AGROBIOSPHERE" program of the French Research Agency.

VESPA - Value and optimization of early warning system for a durable crop protection. (2013-2016) - Task leader (30K€) - program PSPE1 « Pour et Sur le Plan Ecophyto »

ASIRPA ([www6.inra.fr/asirpa](http://www6.inra.fr/asirpa)) - *Evaluating impact of public agricultural research (2011-2014)* - Funded by INRA.

POPSY - *Arable Crop Production, Environment and Regulation (2010-2013)* -Leader of the workpackage on analysis of the agricultural extension sector - "STRA" program (agricultural durability) of the French Research Agency

*GMO and competition in the agroindustry: analysis of the economic effects of the business practices of the seed, pesticide and agricultural biotechnology firms (2005-2008)* - Leader (22K€) - National program on GMO of the French Research Agency.

## **Personal information**

Citizenship: French.

Status: Divorced, three children.

Date of birth: December 30th, 1968.