

Curriculum vitae

Rémi CARDINAEL (PhD, HDR)
Soil scientist and agronomist



Date of birth : 06/07/1987 (36 years old)

Marital status : Married, two children

✉ CIRAD – UPR AIDA
Bâtiment 2
Avenue d’Agropolis
34398 Montpellier
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✉ University of Zimbabwe -
Department of Plant Production
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Education and research experience

2023 Habilitation to Supervise Research “Habilitation à Diriger des Recherches (HDR)”, from the University of Montpellier, with a scientific essay on “[Management of agricultural soils and climate: carbon sequestration and emissions of greenhouse gases](#)”. Defense: June 16, 2023.

2017- Seconded to the University of Zimbabwe - Department of Plant Production Sciences and Technologies

2016- **Soil scientist and agronomist**, researcher at [Cirad](#) (French Agricultural Research Center for International Development), [UPR AIDA](#) (Agroecology and Sustainable Intensification of Annual Crops).

2012-2015 PhD degree in Soil Science, from the University of Paris-Saclay. Hosted at INRAE (UMR Ecosys) and IRD (UMR Eco&Sols). Thesis: « [Carbon storage and soil organic matter dynamics under Mediterranean and temperate agroforestry systems](#) ». Advisors: Prof. Claire Chenu and Dr Tiphaine Chevallier. Thesis defense: November 27, 2015.

2013 Climate-KIC (five-week summer school, entrepreneurship and climate change). Climate-KIC is one of the three Knowledge and Innovation Communities created in 2010 by the European Institute of Innovation and Technology. Climate-KIC is Europe’s largest public-private innovation partnership focused on climate change.

- 2011-2012** (1 year) ANR funded project **ECOSFIX** (Ecosystem Services of Roots – Hydraulic Redistribution, Carbon Sequestration and Soil Fixation). **INRA, UMR System**. In charge of coordinating research at the agroforestry experimental site of Restinclières, pit soil and root sampling, root growth measurements, results' analyses.
- 2011** (6 months) **AGROOF** (engineering office specialized in agroforestry systems) and **Regional Chamber of Agriculture**. In charge of investigating the potential of development of agroforestry systems in southern France within the framework of energy and climate territorial plans (mapping with ArcGIS, survey of farmers).
- 2011 MSc degree** in Agronomy at **AgroParisTech**, the Life and Environmental Science and Technology department of ParisTech, the Paris Institute of Technology, which is a consortium of 10 of the foremost French Graduate Institutes in Science and Engineering.
- 2010** (6 months) **CARBOSOIL** project (Getting a better understanding of soil carbon dynamics in order to improve its modelling within a context of climate change). **INRA, UMR Bioemco**. In charge of modelling carbon dynamics and priming effect in a long-term experiment.
- 2009** (6 months) **University of Guelph**, School of Environmental Sciences, **Ontario, Canada**. In charge of quantifying organic carbon and nitrogen pools in an agroforestry system.

International expertise and editorial roles

- Editor-in-Chief of the international peer-reviewed, open access and not-for-profit EGU [SOIL journal](#) (since 11/2023).
- Associate Editor for international peer-reviewed journals: [Agroforestry Systems](#) (since 09/2022), [Frontiers in Soil Science](#), section “Soil Organic Matter Dynamics and Carbon Sequestration” (02/2021-08/2023), [Plant and Soil](#) (since 09/2020).
- Guest Editor for two Special Issues: [Agroforestry: a belowground perspective](#) published in *Plant and Soil* in August 2020, and [Climate change mitigation and adaptation in agriculture: Why agroforestry should be part of the solution](#) published in *Agriculture, Ecosystems and Environment* in August 2021.
- IPCC contributing Author of the 2019 Refinement to the 2006 Guidelines for National Greenhouse Gas Inventories, Cropland - Chapter 5, in: Volume 4 - Agriculture, Forestry and Other Land Use.
- Scientific committee member of the 4th (<https://agroforestry2019.cirad.fr/>) and the 5th (<https://agroforestry2022.org/en>) World Congress on Agroforestry, and of 9th International Symposium on Soil Organic Matter (<https://som2024.um6p.ma/event/b13eb877-8195-4df8-926e-2f0f3c4e4097/summary>). Chair of two sessions during these conferences: “Mitigating climate change with agroforestry”, “Transitioning to Food Security and Health”.
- International workshops organized: [Can albedo change offset the climate benefit of carbon sequestering practices?](#), [Biophysical & biogeochemical effects of nature based solutions – Toward an integrated evaluation of their climate mitigation potential](#)
- Reviewer for the following peer-reviewed journals: Agricultural Systems, Agriculture, Ecosystems and Environment, Agroforestry Systems, Agronomy for Sustainable Development, **Communications Earth & Environment**, Current Research in Environmental Sustainability, Ecological Engineering, Environmental Research

Letters, European Journal of Soil Science, Forest, Ecology and Management, Geoderma, **Global Change Biology**, Journal of Plant Nutrition and Soil Science, Land Degradation and Development, **Nature Climate Change**, **Nature Geoscience**, **Nature Sustainability**, Plant and Soil, Regional Environmental Change, Science of the Total Environment, Soil and Tillage Research, Soil Use and Management.

- Reviewer of research projects for: ADEME, Czech Science Foundation, European Science Foundation, Fonds de recherche du Québec, Natural Sciences and Engineering Research Council of Canada.
- EU Expert Horizon Europe 2021-2027.

Teaching experience

2013-2014 Master 2 « Ecosystem » - SupAgro (National School of Agronomy in Montpellier, France). Ecological functioning of soils (6 hours).

2013 Master 2 « Sustainable plant production » - SupAgro. In situ diagnosis of agrosystems (8 hours).

Participation to research projects

- [CrosyeN](#) (2022-2027) “Soutien aux infrastructures, expérimentations systèmes de culture”. Funded by the French National Research Agency (ANR) through the [PEPR FairCarboN](#). Budget: 1.5 M€.
- [ALAMOD](#) (2022-2028) “Vers des modèles de dynamique du carbone dans les écosystèmes partagés, validés sur un outil de benchmark incontournable”. Funded by the French National Research Agency (ANR) through the [PEPR FairCarboN](#). Budget: 7 M€.
- [IntercropValuES](#) (2022-2026) “Developing Intercropping for agrifood Value chains and Ecosystem Services delivery in Europe and Southern countries”. Funded by EU Horizon Europe. Budget: 8 M€.
- [ORCaSa](#) (2022-2025) “Operationalising the International Research Cooperation on Soil Carbon”. Funded by EU Horizon Europe. Budget: 3.09 M€.
- [RAIZ](#) (2022-2025) “Resilience building through agroecological intensification in Zimbabwe”. Funded by EU Desira. Budget: 4.2 M€.
- [ASSET](#) (2021-2026) “Agroecology and Safe food System Transitions in South-East Asia”. Funded by AFD, FFEM. Budget: 18.5 M€.
- [LIPS-Zim](#) (2020-2024) “Adoption and scaling up of improved livestock production systems in Zimbabwe”. Funded by EU Desira. Budget: 5 M€.
- [DSCATT](#) (2019-2024) “Agricultural Intensification and Dynamics of Soil Carbon Sequestration in Tropical and Temperate Farming Systems”. Funded by Agropolis Foundation and Total Foundation. Budget: 1.7 M€. Workpackage leader.
- [ACCURATE](#) (2019-2021) “Albedo, Conservation agriculture and climate bEnefit”. Funded by CIMMYT CRP Maize. Budget: 60 k\$. Project coordinator.
- [LANCELOT](#) (2019-2021) “aLbedo chANge and Climate bEnefit in Land-based mitigatiOn pracTices” Funded by CIRAD. Budget: 13.6 k€. Project coordinator.
- [DATA4C+](#) (2019-2021) “Interopérabilité des bases de données sur le carbone du sol dans le cadre de l'Initiative 4 pour 1000”. Funded by the French National Research Agency (ANR). Budget: 370 k€.
- [CIRCASA](#) (2017-2021) « Coordination of International Research Cooperation on soil CARbon Sequestration in Agriculture ». Funded by EU H2020. Budget: 3.9 M€.

- [Soil2Crop](#) (2017-2019) “Effect of intercropping and agroforestry on crop mineral composition along soil fertility gradients in Zimbabwe”. Funded by meta-programme INRAE-CIRAD GloFoodS “Transitions to global food security”. Budget: 45 k€. Project coordinator.
- [AGRIPSOL](#) (2012-2015) “Agroforesterie pour la protection des sols”. Funded by ADEME. Budget: 383 k€. Workpackage leader.
- [ECOSFIX](#) (2011-2014) “Services écosystémiques des racines – redistribution hydrique, séquestration du carbone et fixation du sol”. Funded by the French National Research Agency (ANR). Budget: 938 k€.
- [CARBOSOIL](#) (2008-2012) “Mieux comprendre la dynamique du carbone des sols afin d’améliorer la modélisation dans un contexte de changement climatique”. Funded by the GIS-Climat. Budget: 306 k€.

Publications in peer-reviewed journals

- [47] Gottschalk P, Klumpp K, **Cardinael R**, Ceschia E, Diop S, Genesio L, Khalil MI, Kruijt B, Lugato E, Roujean J-L, Sieber P, Osborne B, **2024**. Making Earth a Brighter Place: Reflecting on Surface Albedo and Climate. (submitted)
- [46] Batjes NH, Ceschia E, Heuvelink GBM, Demenois J, le Maire G, **Cardinael R**, Arias-Navarro C, van Egmond F, **2024**. Towards a generic, multi-ecosystem Monitoring, Reporting and Verification (MRV) framework for soil organic carbon stock change assessment – A review. (submitted)
- [45] Diop S, **Cardinael R**, Lauerwald R, Ferlicoq M, Thierfelder C, Chikowo R, Corbeels M, Ceschia E, **2024**. Surface albedo and thermal radiation dynamics under conservation and conventional agriculture from two contrasting soils in sub-humid Zimbabwe. (submitted)
- [44] Leng V, **Cardinael R**, Tivet F, Seng V, Mark P, Lienhard P, Filloux T, Six J, Hok L, Boulakia S, Briedis C, de Moraes Sá JC, Thuriès L, **2024**. Diachronic assessment of soil organic C and N dynamics under long-term no-till cropping systems in the tropical upland of Cambodia. (submitted)
- [43] Laub M, Le Goff U, Prébandier M, Six J, **Cardinael R**, **2024**. A novel approach to use the DayCent model for simulating agroforestry systems with multiple components. (submitted)
- [42] Nyawasha RW, Wadoux AMJ-C, Todoroff P, Chikowo R, Falconnier G, Lagorsse M, Corbeels M, **Cardinael R**, **2024**. Multi-output deep learning prediction of soil properties from near-infrared, mid-infrared and their combined spectra. (in revision)
- [41] Shumba A, Chikowo R, Thierfelder C, Corbeels M, Six J, **Cardinael R**, **2024**. Mulch application as the overarching factor explaining increase in soil organic carbon stocks under conservation agriculture in two 8-year-old experiments in Zimbabwe. [SOIL 10, 151-165](#)
- [40] Couëdel A, Falconnier GN, Adam M, **Cardinael R**, Boote K, Justes E, Smith WN, Whitbread AM, Affholder F, Balkovic J, Basso B, Bhatia A, Chakrabarti B, Chikowo R, Christina M, Faye B, Ferchaud F, Folberth C, Akinseye FM, Gaiser T, Galdos MV, Gayler S, Gorooei A, Grant B, Guibert H, Hoogenboom G, Kamali B, Laub M, Maureira F, Mequanint F, Nendel C, Porter CH, Ripoche D, Ruane AC, Rusinamhodzi L, Sharma S, Singh U, Six J, Srivastava A, Vanlauwe B, Versini A, Vianna M, Webber H, Weber TKD, Zhang C, Corbeels M, **2024**. Long-term soil organic carbon and crop yield feedbacks differ between 16 soil-crop models in sub-Saharan Africa. [European Journal of Agronomy 155, 127109](#)

- [39] Renna V, Martin-Gallego P, Julian F, Six J, **Cardinael R**, Laub M, **2024**. Initial soil carbon losses may offset decades of biomass carbon accumulation in Mediterranean afforestation. [Geoderma Regional 36, e00768](#)
- [38] Poeplau C, Liang Z, Don A, Seitz D, De Notaris C, Angers D, Barré P, Beillouin D, **Cardinael R**, Ceschia E, Chenu C, Constantin J, Demenois J, Mary B, Pellerin S, Plaza-Bonilla D, Quemada M, Justes E, **2024**. Cover crops do increase soil organic carbon stocks – a critical comment on Chaplot & Smith (2023). [Global Change Biology 30, 17128](#)
- [37] Namatsheve T, **Cardinael R**, Chikowo R, Corbeels M, Rugare J, Mabasa S, Ripoche A, **2024**. Do intercropping and mineral nitrogen fertilizer affect weed community structures in low-input maize-based cropping systems? [Crop Protection 176, 106486](#)
- [36] Terasaki Hart D, Yeo S, Almaraz M, Beillouin D, **Cardinael R**, Garcia E, Kay S, Lovell S, Rosenstock T, Sprenkle-Hyppolite S, Stolle F, Suber M, Thapa B, Wood S, Cook-Patton S, **2023**. Priority Science Can Accelerate Agroforestry as a Natural Climate Solution. [Nature Climate Change 13, 1179-1190](#)
- [35] Falconnier GN, **Cardinael R**, Corbeels M, Baudron F, Chivenge P, Couëdel A, Ripoche A, Affholder F, Naudin K, Benailon E, Rusinamhodzi L, Leroux L, Vanlauwe B, Giller K, **2023**. The input reduction principle of agroecology is wrong when it comes to mineral fertilizers use in sub-Saharan Africa. [Outlook on Agriculture 52 \(3\) 311-326](#)
- [34] Beillouin D, Corbeels M, Demenois J, Berre J, Boyer A, Fallot A, Feder F, **Cardinael R**, **2023**. A Global Meta-analysis of Soil Organic Carbon in the Anthropocene. [Nature Communications 14: 3700](#)
- [33] Le Noë J, Manzoni S, Abramoff RZ, Bruni E, **Cardinael R**, Ciais P, Chenu C, Clivot H, Derrien D, Ferchaud F, Garnier P, Goll D, Lashermes G, Martin M, Rasse DP, Rees F, Sainte-Marie J, Salmon E, Schiedung M, Schimel J, Wieder WR, Abiven S, Barré P, Cécillon L, Guenet B, **2023**. Soil organic carbon models need more independent time-series validation for reliable predictions. [Communications Earth & Environment 4: 158](#)
- [32] Fujisaki K, Chevallier T, Bispo A, Laurent J-B, Thévenin F, Chapuis-Lardy L, **Cardinael R**, Le Bas C, Freycon V, Benedet F, Blanfort V, Brossard M, Tella M, Demenois J, **2023**. Semantics about soil organic carbon storage: DATA4C+, a comprehensive thesaurus and classification of management practices in agriculture and forestry. [SOIL 9: 89-100](#)
- [31] Bamière L, Bellassen V, Angers D, **Cardinael R**, Ceschia E, Chenu C, Constantin J, Delame N, Diallo A, Graux A-I, Houot S, Klumpp, K, Launay C, Letort E, Martin R, Mézières D, Mosnier C, Réchauchère O, Schiavo M, Théron O, Pellerin S, **2023**. A Marginal Abatement Cost Curve for Greenhouse gases attenuation by additional carbon storage in French agricultural land. [Journal of Cleaner Production 383: 135423](#)
- [30] Shumba A, Chikowo R, Corbeels M, Six J, Thierfelder C, **Cardinael R**, **2023**. Long-term tillage, residue management and crop rotation impacts on N₂O and CH₄ emissions from two contrasting soils in sub-humid Zimbabwe. [Agriculture, Ecosystems and Environment 341: 108207](#)
- [29] Minasny B, Arrouays D, **Cardinael R**, Chabbi A, Henry B, Koutika LS, Ladha JK, McBratney AB, Padarian J, Roman-Dobarco M, Rumpel C, Smith P, Soussana JF, **2022**. Current NPP cannot predict future soil organic carbon sequestration potential. Comment on “Photosynthetic limits on carbon sequestration in croplands” [Geoderma 424: 115975](#)

- [28] Beillouin D, Demenois J, **Cardinael R**, Berre D, Corbeels M, Fallot A, Boyer A, Feder F, **2022**. A global database of land management, land use change and climate change effects on soil organic carbon. [Scientific Data 9 \(228\) 1-10](#)
- [27] Angers DA, Arrouays D, **Cardinael R**, Chenu C, Corbeels M, Demenois J, Farrell M, Martin M, Minasny B, Recous S, Six J, **2022**. A well-established fact: rapid mineralization of organic inputs is an important factor for soil carbon sequestration. Comment on “Soil carbon sequestration for climate change mitigation: Mineralization kinetics of organic inputs as an overlooked limitation”. [European Journal of Soil Science 73 \(3\) e13242](#)
- [26] Beillouin D, **Cardinael R**, Berre D, Boyer A, Corbeels M, Fallot A, Feder F, Demenois J, **2022**. A global overview of studies about management, land-use change and climate change effects on soil organic carbon. [Global Change Biology 28 \(4\): 1690-1702](#)
- [25] **Cardinael R**, Guibert H, Brédoumy STK, Gigou J, N’Goran KE, Corbeels M, **2022**. Sustaining maize yields and soil carbon following land clearing in the forest–savannah transition zone of West Africa: Results from a 20-year experiment. [Field Crops Research 275: 108335](#)
- [24] Mayer S, Wiesmeier M, Sakamoto E, Hübner R, **Cardinael R**, Kühnel A, Kögel-Knabner I, **2022**. Soil organic carbon sequestration in temperate agroforestry systems – A meta-analysis. [Agriculture, Ecosystems and Environment 323: 107689](#)
- [23] Cambou A, Allory V, **Cardinael R**, Carvalho Vieira L, Barthès BG, **2021**. Comparison of soil organic carbon stocks predicted using visible and near infrared reflectance (VNIR) spectra acquired in situ vs. on sieved dried samples: synthesis of different studies. [Soil Security 5: 100024](#)
- [22] **Cardinael R**, Cadish G, Gosme M, Oelbermann M, van Noordwijk M, **2021**. Climate change mitigation and adaptation in agriculture: Why agroforestry should be part of the solution. [Agriculture, Ecosystems and Environment 319: 107555](#)
- [21] Namatsheve T, Chikowo R, Corbeels M, Mouquet-Rivier C, Icard-Vernière C, **Cardinael R**, **2021**. Maize-cowpea intercropping as an ecological intensification option for low input systems in sub-humid Zimbabwe: productivity, biological N₂-fixation and grain mineral content. [Field Crops Research 263\(1\): 108052](#)
- [20] Portell X, Sauzet O, Balseiro-Romero M, Benard P, **Cardinael R**, Couradeau R, Danra DD, Evans DL, Fry EL, Hammer EC, Mamba D, Merino-Martin L, Mueller CW, Paradelo M, Rees F, Rossi LMW, Schmidt H, Schnee LS, Védère C, Vidal A, **2021**. Bypass and hyperbole in soil science: A perspective from the next generation of soil scientists. [European Journal of Soil Science 72\(1\): 31-34](#)
- [19] Guenet B, Gabrielle B, Chenu C, Arrouays D, Balesdent J, Bernoux M, Bruni E, Caliman J-P, **Cardinael R**, Chen S, Ciais P, Desbois D, Fouché J, Frank S, Hénault C, Lugato E, Naipal V, Nesme T, Obersteiner M, Pellerin S, Powlson DS, Rasse D, Rees F, Soussana J-F, Su Y, Tian H, Valin H, Feng Z, **2021**. Can N₂O emissions offset the benefits from soil organic carbon storage? [Global Change Biology 27\(2\): 237-256](#)
- [18] **Cardinael R**, Mao Z, Chenu, C, Hinsinger P, **2020**. Belowground functioning of agroforestry systems: recent advances and perspectives. [Plant and Soil 453 \(1\):1-13](#)
- [17] Namatsheve T, **Cardinael R**, Corbeels M, Chikowo R, **2020**. Productivity and biological N₂-fixation in cereal-cowpea intercropping systems in sub-Saharan Africa. A review. [Agronomy for Sustainable Development 40 \(30\):1-12](#)

- [16] Rossi LM, Mao Z, Merino-Martin L, Roumet C, Fort F, Taugourdeau O, Boukcim H, Fourtier S, Del Rey-Granado M, Chevallier T, **Cardinael R**, Fromin N, Stokes A, **2020**. Pathways to persistence: plant root traits alter carbon accumulation in different soil carbon pools. [Plant and Soil 452:457-478](#)
- [15] Zhu X, Liu W, Chen J, Bruijnzeel LA, Mao Z, Yang X, **Cardinael R**, Meng F-R, Sidle RC, Seitz S, Nair VD, Nanko K, Zou X., Chen C, Jiang XJ, **2020**. Reductions in water, soil and nutrient losses and pesticide pollution in agroforestry practices: a review of evidence and processes. [Plant and Soil 453 \(1\):45-86](#)
- [14] **Cardinael R**, Chevallier T, Guenet B, Girardin C, Cozzi T, Pouteau V, Chenu C, **2020**. Organic carbon decomposition rates with depth and contribution of inorganic carbon to CO₂ emissions under a Mediterranean agroforestry system. [European Journal of Soil Science 71:909-923](#)
- [13] Corbeels M, **Cardinael R**, Powlson DS, Chikowo R, Gerard B, **2020**. Carbon sequestration potential through conservation agriculture in Africa has been largely overestimated: Comment on: “Meta-analysis on carbon sequestration through conservation agriculture in Africa”. [Soil and Tillage Research 196 \(104300\):1-3](#)
- [12] **Cardinael R**, Hoeffner K, Chenu C, Chevallier T, Béral C, Dewisme A, Cluzeau D, **2019**. Spatial variation of earthworm communities and soil organic carbon in temperate agroforestry. [Biology and Fertility of Soils 55 \(2\):171-183](#)
- [11] Corbeels M, **Cardinael R**, Naudin K, Guibert H, Torquebiau E, **2019**. The 4 per 1000 goal and soil carbon storage under agroforestry and conservation agriculture systems in sub-Saharan Africa. [Soil and Tillage Research 188:16-26](#)
- [10] **Cardinael R**, Umulisa V, T Anass, Olivier A, Bockel L, Bernoux M, **2018**. Revisiting IPCC Tier 1 coefficients for soil organic and biomass carbon storage in agroforestry systems. [Environmental Research Letters 13 \(124020\):1-20](#)
- [09] **Cardinael R**, Guenet B, Chevallier T, Dupraz C, Cozzi T, Chenu C, **2018**. High organic inputs explain shallow and deep SOC storage in a long-term agroforestry system – Combining experimental and modeling approaches. [Biogeosciences 15:297-317](#)
- [08] **Cardinael R**, Chevallier T, Cambou A, Béral C, Barthès BG, Dupraz C, Durand C, Kouakoua E, Chenu C, **2017**. Increased soil organic carbon stocks under agroforestry: a survey of six different sites in France. [Agriculture, Ecosystems & Environment 236:243-255](#)
- [07] Germon A*, **Cardinael R***, Dupraz C, Prieto I, Mao Z, Kim JH, Stokes A, Laclau J-P, Jourdan C, **2016**. Unexpected phenology and lifespan of shallow and deep fine roots of walnut trees grown in a Mediterranean agroforestry system. [Plant and Soil 401:409-426](#)
- * Equal contribution
- [06] Cambou A, **Cardinael R**, Kouakoua E, Villeneuve M, Durand C, Barthès BG, **2016**. Prediction of soil organic carbon stock using visible and near infrared reflectance spectroscopy (VNIRS) in the field. [Geoderma 261:151-159](#)
- [05] **Cardinael R**, Chevallier T, Barthès BG, Saby NPA, Parent T, Dupraz C, Bernoux M, Chenu C, **2015**. Impact of alley cropping agroforestry on stocks, forms and spatial distribution of soil organic carbon – A case study in a Mediterranean context. [Geoderma 259-260:288-299](#)
- [04] **Cardinael R**, Mao Z, Prieto I, Stokes A, Dupraz C, Kim JH, Jourdan C, **2015**. Competition with winter crops induces deeper rooting of walnut trees in a Mediterranean alley cropping agroforestry system. [Plant and Soil 391:219-235](#)

- [03] **Cardinael R**, Eglin T, Guenet B, Neill C, Houot S, Chenu C, **2015**. Is priming effect a significant process for long-term SOC dynamics? Analysis of a 52-years old experiment. [Biogeochemistry 123:203-219](#)
- [02] Prieto I, Roumet C, **Cardinael R**, Kim JH, Maeght, J-L, Mao Z, Portillo N, Thammahacksa C, Dupraz C, Jourdan C, Pierret A, Roupsard O, Stokes A, **2015**. Root functional parameters along a land-use gradient: evidence of a community-level economics spectrum. [Journal of Ecology 103:361-373](#)
- [01] **Cardinael R**, Thevathasan N, Gordon A, Clinch R, Mohammed I, Sidders D, **2012**. Growing woody biomass for bioenergy in a tree-based intercropping system in southern Ontario, Canada. [Agroforestry Systems 86:279–286](#)

Other publications

- [17] Chotte J-L, Barot S, Blanchart E, Blanfort V, Brauman A, **Cardinael R**, Demenois J, Lardy L, Luu P, Masse D, Chevallier T, Trap J, Wadoux AMJ-C, **2023**. Healthy soils sustain food system transformations to contribute to the net zero CO₂ emission target by 2050. Policy Brief, COP 28.
- [16] Batjes NH, Ceschia E, Heuvelink GBM, Demenois J, Le Maire G, **Cardinael R**, Arias Navarro C, van Egmond F, **2023**. International review of current MRV initiatives for soil carbon stock change assessment and associated methodologies (ORCaSa Deliverable 4.1). <https://hal.inrae.fr/hal-04223125>
- [15] Vanlauwe B, Amede T, Bationo A, Bindraban P, Breman H, **Cardinael R**, Couëdel A, Chivenge P, Corbeels M, Dobermann A, Gatién F, Fatunbi W, Giller K, Harawa R, Kamau M, Merckx R, Palm C, Powelson D, Rusinamhodzi L, Six J, Singh U, Stewart Z, van Ittersum M, Witt C, Zingore S, Groot R, **2023**. Fertilizer and Soil Health in Africa: The Role of Fertilizer in Building Soil Health to Sustain Farming and Address Climate Change. <https://hub.ifdc.org/handle/20.500.14297/2085>
- [14] Koutika L-S, Marron N, **Cardinael R**, **2022**. The contribution of agroforestry systems to improving soil carbon sequestration. In: Rumpel C (Ed.), *Understanding and Fostering Soil Carbon Sequestration*. Burleigh Dodds Science Publishing, Cambridge, UK. p. 589-616 <http://dx.doi.org/10.19103/AS.2022.0106.19>
- [13] **Cardinael R**, Deheuvelds O, Leroux L, Subervie J, Suwa-Eisenmann A, Bessou C, Bouquet E, Catry T, Chikowo R, Corbeels M, Demarchi G, Diouf AA, Falconnier G, Faye NF, Gignoux J, Icard-Vernière C, Jahel C, Katic P, Libois F, Mercier S, Mouquet-Rivier C, Namatsheve T, Renk A, Sirdey N, Tritsch I, Verger E, **2022**. Food security and natural resources: diversification strategies. In: Thomas A (ed.), Alpha A (ed.), Barczak A (ed.), Zakhia-Rozis N (ed.). *Sustainable Food Systems as a Pathway to Food and Nutritional Security. Need for Combination of Local and Global Approaches*. Editions Quae. p. 171-185. <https://doi.org/10.35690/978-2-7592-3576-6>
- [12] Fungo B, Wiesmeier M, **Cardinael R**, **2021**. Agroforestry 1: Agrisilvicultural systems, in: *Recarbonizing Global Soils: A Technical Manual of Recommended Management Practices*. Volume 3: Cropland, Grassland, Integrated Systems and Farming Approaches – Practices Overview. FAO and ITPS, Rome, pp. 474–486. <https://doi.org/10.4060/cb6595en>
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Other communications

- 2023** Podcast for the Agence France Presse (AFP) “Sur la Terre”: “[Capturer le CO₂ : la solution miracle ?](#)” / [Carbon capture, is it really the miracle solution?](#)
- 2023** Article The Conversation “[Piéger le carbone dans le sol : ce que peut l’agriculture](#)” / “[How agriculture can make the most of one of the world’s biggest carbon stocks, soil](#)”
- 2023** Interview for a blog article of The Nature Conservancy “[It’s Time to Embrace the Potential of Agroforestry as a Climate Solution](#)”
- 2023** Interview for a press release of The Nature Conservancy “[Farming with Trees: New Study Highlights the Potential of Agroforestry to Fight Climate Change](#)”
- 2019** Interviewed for the RFI radio programme *C’est pas du vent* “[Congrès mondial d’agroforesterie: mode d’emploi d’une technique agricole prometteuse!](#)”
- 2018** Interviewed for the journal Sciences & Avenir.

- 2015** Interviewed for two TV reports on agroforestry systems. National TV news 23/02/2015 (France 2, 20h), regional TV news 19/03/2015 (France 3, 19h).
- 2012** Master 2 « Tropical plant biodiversity » - University of Montpellier 2. **Invited** to a **round-table conference** on ecosystem services provided by agroforestry systems.

Cirad communications

- 2023** [Piéger le carbone dans le sol : ce que peut l'agriculture](#)
- 2023** [En Afrique subsaharienne, fertilisation minérale et agroécologie ne sont pas incompatibles](#)
- 2023** [L'agroforesterie peut jouer un rôle clé dans la lutte contre le changement climatique](#)
- 2023** [Carbone des sols : un panorama mondial des impacts des activités humaines](#)
- 2022** [Intensification agroécologique en Afrique et climat : des résultats prometteurs au Zimbabwe](#)
- 2021** [Carbone du sol : une synthèse mondiale pour identifier les besoins et mieux répondre aux enjeux globaux](#)
- 2021** [Prendre en compte l'albédo des sols pour mieux atténuer le changement climatique](#)
- 2020** [La nécessaire gestion du protoxyde d'azote dans les sols agricoles](#)
- 2018** [Le carbone stocké par l'agroforesterie mieux pris en compte par le GIEC](#)