



# Daniel Plaza

## Investigador "Ramón y Cajal"

### Dades personals



**Categoria:** Investigador "Ramón y Cajal"

**Àrea de coneixement:** Agronomia

**Adreça:** ETSEA, Edifici Principal B, despatx 1.23.1

**Telèfon:** +34 973 702856

**E-mail:** [daniel.plaza@udl.cat](mailto:daniel.plaza@udl.cat) [ <mailto:achon@pvcf.udl.cat> ]

Personal website: [www.danielplazabonilla.eu](http://www.danielplazabonilla.eu) [ <http://www.danielplazabonilla.eu> ]

### Formació Acadèmica

- Enginyer Tècnic Agrícola esp. Explotacions Agropecuàries (UdL), 2006
- Enginyer agrònom (UdL), 2009
- Master de Recerca en Sistemes de Producció Agroalimentaria (UdL), 2011
- Doctorat en Agronomia (UdL), 2013

### Experiència Professional

- 2020- actualitat, Investigador Ramón y Cajal, Universitat de Lleida
- 2018-2020, Investigador Juan de la Cierva, Universitat de Lleida
- 2016-2018, Investigador Juan de la Cierva, Estación Experimental de Aula Dei, CSIC (Zaragoza)
- 2014-2016, Investigador postdoctoral, Institut National de la Recherche Agronomique (INRA, Toulouse)
- 2009-2013, Estudiant de doctorat, Universitat de Lleida

### Recerca



His research focuses on the design and assessment of innovative climate-smart cropping system alternatives based on lower environmental impact, and adequate productivity, for a sustainable use of natural resources. The approach is systemic based on empirical techniques and soil-crop modelling

## Docència

### · AGRONOMIA

<https://guiadocent.udl.cat/pdf/es/>

Doble Grau: Grau en Veterinària i Grau Producció Animal

MEASUREMENTS AND CONTROL IN ECOPHYSIOLOGY

Màster Mediterranean Forestry and Natur Management (MEDfOR)

## Projectes I+D+i

*ECological TrAnsition of CEreal production: multidisciplinary assessment of mitigation and adaptation strategies to cope with climate change and reduce environmental impacts (ECO-TRACE).* Project PI: **Daniel Plaza-Bonilla**. Funding body: MCIN - Ministerio de Ciencia e Innovación. PTED - Transición Ecológica y Transición Digital. Ref: TED2021-131895A-I00. Duration: 01/12/2022 – 30/11/2024.

*Mediterranean cereal grain systems for healthier soils and enhanced sustainability (GRAIN-SYST).* Project coordinator: IRTA. **UdL PI: Daniel Plaza-Bonilla**. Funding Body: MCIN - Ministerio de Ciencia e Innovación. Programa de Generación de Conocimiento. Ref: PID2021-127339OR-C44. Duration: 01/09/2022 – 31/08/2026.

*Organic intercropping: a resilient strategy for future climate? ASSOCIECO.* Project PI: **Daniel Plaza-Bonilla**. Funding Body: Recerca Aplicada en matèria de producció agroalimentària ecològica. Departament d'Agricultura, Ramaderia, Pesca i Alimentació de la Generalitat de Catalunya. Duration: 01/02/2021 – 31/10/2022.

*LegSapiens. Generando Oportunidades: sistemas de cultivo innovadores basados en las leguminosas grano.* Project coordinator: UPA. **UdL PI: Daniel Plaza-Bonilla**. Funding body: Programa nacional de desarrollo rural 2014-2020 por el Fondo Europeo Agrícola de Desarrollo Rural-FEADER y el Ministerio de Agricultura, Pesca y Alimentación. Partners: UPA, UdL, IMIDRA, ITAGRA, OCT, ASG S.A., Explotaciones Agropecuarias San Miguel S.L. Duration: 15/03/2021-15/03/2023.

*Effect of commercial chicken manure and mycorrhizae inoculant on the establishment, growth and partial development of Rooibos plants (Aspalathus linearis) – An outdoor pot trial.* Project PI: Anélia Marais (Stellenbosch University, South Africa). Funding body: Research and Technology Development. Western Cape Government – Agriculture. Duration: 30/11/2020-31/03/2023.

*Organic soybean production in Catalonia is feasible: technological innovations to attain it. PROSOY.* Project PI: **Daniel Plaza-Bonilla**. Funding Body: Recerca Aplicada en matèria de producció agroalimentària ecològica. Departament d'Agricultura, Ramaderia, Pesca i Alimentació de la Generalitat de Catalunya. Duration: 10/07/2020 – 01/11/2021.



*Boost ecosystem services through high Biodiversity-based Mediterranean Farming sYstems. Biodiversify.* Project coordinator: Eric Justes. Spanish partner PI: Jorge Lampurlanés Castel. Funding Body: Partnership for Research and Innovation in the Mediterranean Area (PRIMA). Section 2 Multi-topic 2020 Call. Acciones de Programación Conjunta Internacional. Duration: 01/10/2020-30/09/2023.

*Increasing the productivity and sustainability of the European production plant protein by closing the grain legumes yield gap. Legume Gap.* Project coordinator: Fred Stoddard. **Spanish partner PI: Daniel Plaza-Bonilla.** Funding Body: FACCI-JPI SUSCROP. Acciones de Programación Conjunta Internacional. Duration: 04/01/2019-03/31/2022.

## Publicacions Recents

Lamichhane, J.R.; Alletto, L.; Cong, W.; Dayoub, E.; Maury, P.; **Plaza-Bonilla, D.**; Reckling, M.; Saia, S.; Soltani, E.; Tison, E.; Tison, G.; Debaeke, P. 2023. Relay cropping for sustainable intensification of agriculture across temperate regions: crop management challenges and future research priorities. *Field Crops Research* 291, 108795. DOI: doi.org/10.1016/j.fcr.2022.108795

Talukder, R.; **Plaza-Bonilla, D.**; Cantero-Martínez, C.; Wendroth, O.; Lampurlanés, J. 2023. Soil hydraulic properties and pore dynamics under different tillage irrigated crop sequences. *Geoderma* 430, 116293. DOI:10.1016/j.geoderma.2022.116293

Talukder, R.; **Plaza-Bonilla, D.**; Cantero-Martínez, C.; Di Prima, S.; Lampurlanés, J. 2022. Spatio-temporal variation of surface soil hydraulic properties under different tillage and maize-based crop sequences in a Mediterranean area. *Plant and Soil*. DOI: doi.org/10.1007/s11104-022-05758-x.

Alletto, L.; Celette, F.; Drexler, D.; **Plaza-Bonilla, D.**; Reckling, M. 2022. Editorial: crop diversification, a key pillar for the agroecological transition. *Frontiers in Agronomy*. 4:950822. DOI: 10.3389/fagro.2022.950822.

Talukder, R.; **Plaza-Bonilla, D.**; Cantero, C.; Wendroth, O.; Lampurlanés, J. 2022. Soil gas diffusivity and pore continuity dynamics under different tillage and crop sequences in an irrigated Mediterranean area. *Soil and Tillage Research* 221, 105409. DOI: 10.1016/j.still.2022.105409.

Liu, C.; **Plaza-Bonilla, D.**; Coulter, J.A.; Kutcher, H.R.; Beckie, H.J.; Wang, L.; Floc'h, J-B.; Hamel, C.; Siddique, K.H.M.; Li, L.; Gan, Y. 2022. Diversifying crop rotation enhances agroecosystem services and resilience. *Advances in Agronomy* 173, 299-335. DOI: 10.1016/bs.agron.2022.02.007

Kherif, O.; Seghouani, M.; Justes, E.; **Plaza-Bonilla, D.**; Bouhenache, A.; Zemmouri, B.; Dokukin, P.; Latati, M. 2022. The first calibration and evaluation of the STICS soil-crop model on chickpea-based intercropping system under Mediterranean conditions. *European Journal of Agronomy* 133, 126449.

**Plaza-Bonilla, D.**; Mary, B.; Valé, M.; Justes, E. 2022. The sensitivity of C and N mineralization to soil water potential varies with soil characteristics: experimental evidences to fine-tune models. *Geoderma* 409, 115644.

**Plaza-Bonilla, D.**; Lampurlanés, J.; Fernández, F.G.; Cantero-Martínez, C. 2021. Nitrogen fertilization strategies for improved Mediterranean rainfed wheat and barley performance and water and nitrogen use efficiency. *European Journal of Agronomy* 124, 126238.

Pareja-Sánchez, E.; Cantero-Martínez, C.; Álvaro-Fuentes, J.; **Plaza-Bonilla, D.** 2020. Soil organic carbon sequestration when converting a rainfed cropping system to irrigated corn under different tillage systems and N fertilizer rates. *Soil Science Society of America Journal* 84, 1219-1232. DOI: 10.1002/saj2.20116.



Franco-Luesma, S.; Cavero, J.; **Plaza-Bonilla, D.**; Cantero Martínez, C.; Arrúe, J.L.; Álvaro-Fuentes, J. 2020. Tillage and irrigation system effects on soil carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>) emissions in a maize monoculture under Mediterranean conditions. *Soil and Tillage Research* 196, 104488. DOI: 10.1016/j.still.2019.104488.

Pareja-Sánchez, E.; Cantero-Martínez, C.; Álvaro-Fuentes, J.; **Plaza-Bonilla, D.** 2020. Impact of tillage and N fertilization rate on soil N<sub>2</sub>O emissions in irrigated maize in a Mediterranean agroecosystem. *Agriculture, Ecosystems and Environment*, 287, 106687.

Franco-Luesma, S.; Cavero, J.; **Plaza-Bonilla, D.**; Cantero Martínez, C.; Tortosa, G.; Bedmar, E.J.; Álvaro-Fuentes, J. 2019. Irrigation system and tillage effects on soil nitrous oxide (N<sub>2</sub>O) emissions in a maize (*Zea mays* L.) monoculture under Mediterranean conditions. *Agronomy Journal*. DOI: 10.2134/agronj2019.04.0315.

Pareja-Sánchez, E.; **Plaza-Bonilla, D.**; Álvaro-Fuentes, J.; Cantero-Martínez, C. 2019. Is it feasible to reduce tillage and N use while improving maize yield in irrigated Mediterranean agroecosystems? *European Journal of Agronomy* 109, 125919. DOI: 10.1016/j.eja.2019.125919.

Ramos, M.C.; Pareja-Sánchez, E.; **Plaza-Bonilla, D.**; Cantero-Martínez, C.; Lampurlanés, J. 2019. Soil sealing and soil water content under no-tillage and conventional tillage in irrigated corn: effects on grain yield. *Hydrological Processes* 33, 2095-2109. DOI: 10.1002/hyp.13457.

Franco-Luesma, S.; Álvaro-Fuentes, J.; **Plaza-Bonilla, D.**; Arrúe, J.L.; Cantero Martínez, C.; Cavero, J. 2019. Influence of irrigation time and frequency on greenhouse gas emissions in a solid-set sprinkler-irrigated maize under Mediterranean conditions. *Agricultural Water Management* 221, 303-311. DOI: 10.1016/j.agwat.2019.03.042.

Pareja-Sánchez, E.; Cantero-Martínez, C.; Álvaro-Fuentes, J.; **Plaza-Bonilla, D.** 2019. Tillage and nitrogen fertilization in irrigated maize: key practices to reduce soil CO<sub>2</sub> and CH<sub>4</sub> emissions. *Soil and Tillage Research* 191, 29-36. DOI: 10.1016/j.still.2019.03.007.

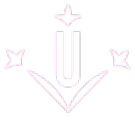
**Plaza-Bonilla, D.**; Nogué-Serra, I.; Raffaillac, D.; Cantero-Martínez, C.; Justes, E. 2018. Carbon footprint of cropping systems with grain legumes and cover crops: A case-study in SW France. *Agricultural Systems* 167, 92-102. DOI: 10.1016/j.agsy.2018.09.004.

**Plaza-Bonilla, D.**; Álvaro-Fuentes, J.; Bareche, J.; Pareja-Sánchez, E.; Justes, E.; Cantero-Martínez, C. 2018. No-tillage reduces long-term yield-scaled soil nitrous oxide emissions in rainfed Mediterranean agroecosystems: a field and modeling approach. *Agriculture, Ecosystems and Environment* 262, 36-47. DOI: 10.1016/j.agee.2018.04.007

Álvaro-Fuentes, J.; **Plaza-Bonilla, D.**; Arrúe, J.L.; Cantero-Martínez, C. 2018. Pig slurry incorporation with tillage does not reduce short-term soil CO<sub>2</sub> fluxes. *Soil and Tillage Research* 179, 82-85. DOI: 10.1016/j.still.2018.02.002.

Pareja-Sánchez, E.; **Plaza-Bonilla, D.**; Ramos, M.C.; Lampurlanés, J.; Álvaro-Fuentes, J.; Cantero-Martínez, C. 2017. Long-term no-till as a means to maintain soil surface structure in an agroecosystem transformed into irrigation. *Soil and Tillage Research* 174, 221-230. DOI: 10.1016/j.still.2017.07.012.

**Plaza-Bonilla, D.**; Álvaro-Fuentes, J.; Bareche, J.; Masgoret, J.; Cantero-Martínez, C.; 2017. Delayed sowing improved barley yield in a no-till rainfed Mediterranean agroecosystem. *Agronomy Journal* 109, 1249-1260. DOI: 10.2134/agronj2016.09.0537.



**Plaza-Bonilla, D.**; Cantero-Martínez, C.; Arrúe, J.L.; Lampurlanés, J.; Álvaro-Fuentes, J. 2017. Do no-till and pig slurry application improve barley yield and water and nitrogen use efficiencies in rainfed Mediterranean conditions? *Field Crops Research* 203, 74-85. DOI: 10.1016/j.fcr.2016.12.008.

Sanz-Cobeña, A.; Lassaletta, L.; Aguilera, E.; del Prado, A.; Garnier, J.; Billen, G.; Iglesias, A.; Sánchez, B.; Guardia, G.; Abalos, D.; **Plaza-Bonilla, D.**; Puigdueta, I.; Moral, R.; Galán, E.; Arriaga, H.; Merino, P.; Infante-Amate, J.; Meijide, A.; Pardo, G.; Alvaro-Fuentes, J.; Gilsanz C.; Báez, D.; Doltra, J.; González-Ubierna, S.; Cayuela, M.L.; Menendez, S.; Diaz-Pines, E.; Le-Noe, J.C.; Quemada, M.; Estellés, F.; Calvet, S.; van Grinsven, H.; Westhoek, H.; Sanz, M.J.; Sánchez-Jimeno, B.; Vallejo, A.; Smith, P. 2017. Strategies for greenhouse gas emissions mitigation in Mediterranean agriculture: A review. *Agriculture, Ecosystems and Environment* 238, 5-24. DOI: 10.1016/j.agee.2016.09.038

Álvaro-Fuentes, J., Arrúe, J.L., Bielsa, A., Cantero-Martínez, C., **Plaza-Bonilla, D.**, Paustian, K. 2017. Simulating climate change and land use effects on soil nitrous oxide emissions in Mediterranean conditions using the Daycent model. *Agriculture, Ecosystems and Environment* 238, 78-88. DOI: 10.1016/j.agee.2016.07.017.

**Plaza-Bonilla, D.**; Léonard, J.; Peyrard, C.; Mary, B.; Justes, E. 2017. Precipitation gradient and crop management affect N<sub>2</sub>O emissions: simulation of mitigation strategies in rainfed Mediterranean conditions. *Agriculture, Ecosystems and Environment* 238, 89-103. DOI: 10.1016/j.agee.2016.06.003.

**Plaza-Bonilla, D.**; Nolot, J.M.; Raffailac, D.; Justes, E. 2017. Innovative cropping systems to reduce N inputs and maintain wheat yields by inserting grain legumes and cover crops in southwest France. *European Journal of Agronomy* 82, 331-341. DOI: 10.1016/j.eja.2016.05.010.

Cantero-Martínez, C.; **Plaza-Bonilla, D.**; Angás, P.; Álvaro-Fuentes, J. 2016. Best management practices of tillage and nitrogen fertilization in Mediterranean rainfed conditions: combining field and modelling approaches. *European Journal of Agronomy* 79, 119-130. DOI: 10.1016/j.eja.2016.06.010.

Álvaro-Fuentes, J.; Arrúe, J.L.; Cantero-Martínez, C.; Isla, D. **Plaza-Bonilla, D.**; Quílez, D. 2016. Fertilization scenarios in sprinkler irrigated corn under Mediterranean conditions: effects on greenhouse gas emissions. *Soil Science Society of America Journal* 80, 662-671. DOI:10.2136/sssaj2015.04.0156.

Lampurlanés, J.; **Plaza-Bonilla, D.**, Álvaro-Fuentes, J.; Cantero-Martínez, C. 2016. Long-term analysis of soil water conservation under different tillage systems in mediterranean rainfed conditions. *Field Crops Research* 189, 59-67. DOI: 10.1016/j.fcr.2016.02.010.

**Plaza-Bonilla, D.**; Nolot, J.M.; Passot, S.; Raffailac, D.; Justes, E. 2016. Grain legume-based rotations managed under conventional tillage need cover crops to mitigate soil organic matter losses. *Soil and Tillage Research* 156, 33-43. DOI: 10.1016/j.still.2015.09.021.

**Plaza-Bonilla, D.**; Arrúe, J.L.; Cantero-Martínez, C.; Fanlo, R.; Iglesias, A.; Álvaro-Fuentes, J. 2015. Carbon management in dryland agricultural systems. A review. *Agronomy for Sustainable Development* 35, 1319-1334. DOI: 10.1007/s13593-015-0326-x

**Plaza-Bonilla, D.**; Nolot, J.M.; Rafailac, D.; Justes, E. 2015. Cover crops mitigate nitrate leaching in cropping systems including grain legumes: Field evidence and model simulations. *Agriculture, Ecosystems and Environment* 212, 1-12. DOI:10.1016/j.agee.2015.06.014.

**Plaza-Bonilla, D.**; Cantero-Martínez, C.; Bareche, J.; Arrúe, J.L.; Álvaro-Fuentes, J. 2014. Soil carbon dioxide and methane fluxes as affected by tillage and N fertilization in dryland conditions. *Plant and Soil* 381, 111-130. DOI: 10.1007/s11104-014-2115-8.





**Plaza-Bonilla, D.;** Álvaro-Fuentes, J; Arrúe, J.L.; Cantero-Martínez, C. 2014. Tillage and nitrogen fertilization effects on nitrous oxide yield-scaled emissions in a rainfed Mediterranean area. *Agriculture, Ecosystems and Environment* 189, 43-52. DOI: 10.1016/j.agee.2014.03.023

Álvaro-Fuentes, J.; **Plaza-Bonilla, D.;** Arrúe, J. L.; Cantero-Martínez, C. 2014. Soil organic carbon storage in a no-tillage chronosequence under Mediterranean conditions. *Plant and Soil* 376, 31-41. DOI: 10.1007/s11104-012-1167-x

**Plaza-Bonilla, D.;** Álvaro-Fuentes, J; Cantero-Martínez, C. 2014. Identifying soil organic carbon fractions sensitive to agricultural management practices. *Soil and Tillage Research* 139, 19-22. DOI: 10.1016/j.still.2014.01.006

**Plaza-Bonilla, D.;** Álvaro-Fuentes, J.; Hansen, N.C., Lampurlanés, J., Cantero-Martínez, C. 2014. Winter cereal root growth and aboveground-belowground ratios as affected by site and tillage system in dryland Mediterranean conditions. *Plant and Soil*. 374, 925-939. DOI: 10.1007/s11104-013-1926-3.

**Plaza-Bonilla, D.;** Cantero-Martínez, C., Álvaro-Fuentes, J. 2014. Soil management effects on soil greenhouse gases production at the macroaggregate scale. *Soil Biology & Biochemistry* 68, 471-481. DOI: 10.1016/j.soilbio.2013.10.026

**Plaza-Bonilla, D.;** Álvaro-Fuentes, J.; Cantero-Martínez, C. 2013. Soil aggregate stability as affected by fertilization type under semiarid no-tillage conditions. *Soil Science Society of America Journal*. 77:284-292. DOI: 10.2136/sssaj2012.0258

**Plaza-Bonilla, D.;** Cantero-Martínez, C.; Viñas, P.; Álvaro-Fuentes, J. 2013. Soil aggregation and organic carbon protection in a no-tillage chronosequence under Mediterranean conditions. *Geoderma*. 193-194: 76-82. DOI:10.1016/j.geoderma.2012.10.022 [ <http://dx.doi.org/10.1016/j.geoderma.2012.10.022> ].

Álvaro-Fuentes, J.; Morell, F.; **Plaza-Bonilla, D.;** Arrúe, J. L.; Cantero-Martínez, C. 2012. Modelling tillage and nitrogen fertilization effects on soil organic carbon dynamics. *Soil and Tillage Research*. 120:32-39. DOI: 10.1016/j.still.2012.01.009

Morell, F. J.; Cantero-Martínez, C.; Lampurlanés, J.; **Plaza-Bonilla, D.;** Álvaro-Fuentes, J. 2011. Soil carbon dioxide flux and organic carbon content: effects of tillage and nitrogen fertilization. *Soil Science Society American Journal*. 75: 1874- 1884. DOI: 10.2136/sssaj2011.0030

**Plaza-Bonilla, D.;** Cantero-Martínez, C.; Álvaro-Fuentes, J. 2010. Tillage effects on soil aggregation and soil organic carbon profile distribution under Mediterranean semiarid conditions. *Soil Use and Management*. 26: 465-474. DOI: 10.1111/j.1475-2743.2010.00298.x