

IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.

Part A. PERSONAL INFORMATION		CV date	10/10/2024
First name	FRANCISCO JAVIER		
Family name	CANO MARTIN		
Gender (*)	Man	Birth date (dd/mm/yyyy)	11/01/1982
ID number	77405547J		
e-mail	fjcanomartin@gmail.com	URL Web	
Open Researcher and Contributor ID (ORCID) (*)	0000-0001-5720-5865		

(*) Mandatory

A.1. Current position

Position	Ramón y Cajal fellow		
Initial date	01/01/2023		
Institution	INIA-CSIC		
Department/Center	Ecología y Genética Forestal	ICIFOR	
Country	Spain	Teleph. number	913474050
Key words	Ecophysiology, photosynthesis, water-use efficiency		

A.2. Previous positions

Period	Position/Institution/Country/Interruption cause
2021-2022	Research Fellow Juan de la Cierva-Incorporación / INIA-CSIC / Spain
2018-2020	Research Fellow (Lecturer) / Hawkesbury Institute for the Environment at Western Sydney University (WSU) / Australia.
2016-2018	Research Fellow (Associated Lecturer) / Hawkesbury Institute for the Environment at Western Sydney University (WSU) / Australia.
2015-2016	Casual academic staff / Hawkesbury Institute for the Environment at Western Sydney University (WSU) / Australia.

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Ingeniero de Montes (Forest Engineer)	Universidad Politécnica de Madrid	25/10/2007
Diploma de estudios avanzados	Universidad Politécnica de Madrid	15/09/2009
University Specialist in Methods in Plant Ecophysiology (Master)	Universitat de les Illes Balears	13/04/2015
Doctor Internacional (PhD)	Universidad Politécnica de Madrid	12/02/2015

Part B. CV SUMMARY (max. 5000 characters, including spaces)

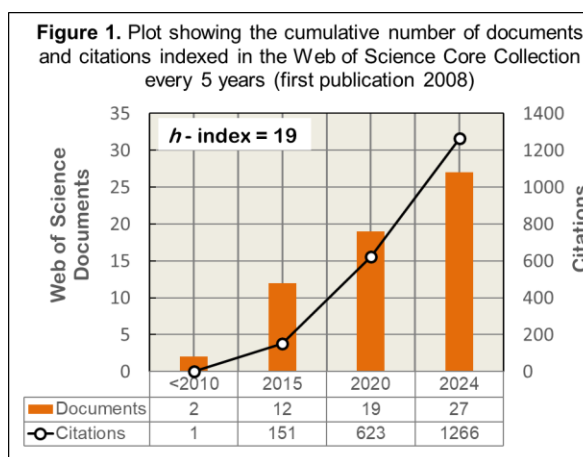
Dr. Javier Cano gained several prizes and awards for outstanding qualifications during bachelor (First class honors) and in February 2015 defended his PhD entitled: 'Mesophyll conductance in forest species: implications for the photosynthetic response to water and light availability' at the Technical University of Madrid (UPM), including stays in European (INRA, three months with Dr Hervé Cochard) and international (The University of Sydney, five months with Prof Charles Warren) centers. His PhD was carried out mostly at the 'Hayedo de Montejo (CAM)', a site listed as a Biosphere Reserve, and for which he was awarded the **second prize for the best doctoral thesis** by the Spanish Society of Forestry Sciences. After a year of paternity leave (his son was born in September 2014), that coincided with the family move to Australia due to a Marie Curie contract of his partner, Dr. Cano held postdoctoral research positions at Western Sydney University (WSU, Australia) in the renowned site for ecological studies *Hawkesbury Institute for the Environment* (HIE) and at the prestigious *Centre of Excellence for Translational Photosynthesis* (ARC CoETP) for almost four years. Then he returned to Spain to start a **Juan de la Cierva - Incorporation fellowship** (JdC) at INIA-CSIC and, since then, Dr Cano holds an **honorary visiting fellowship with WSU (2020-)**. During



his JdC fellowship, Dr Cano was supervisor of one final master's degree project (UPM) and **started the PhD supervision of Mr Faustino Rubio** together with Dr Rosana López (UPM) on **the physiological acclimation of beech to the rise in temperature** (2021-). To booster international collaboration, Dr Cano also **started the PhD co-supervision of Ms Swathy Anija Harikumar** on **sorghum and climate change adaptations** (2021-) together with Prof Oula Ghannoum (WSU) and Dr Usha Chacko (Kerala Agricultural University, India). Overall, Dr Cano has participated in five Spanish **National projects**, one Spanish National Parks project, three regional projects (CAM), one European COST Action (E52) and led as **principal investigator two Australian projects**, one for young researchers (**\$15,000**) that was followed by an Agility Research grant for **\$50,000** both funded by the ARC CoETP and participated in another ARC project. He has taught Plant Physiology at The University of Sydney and WSU (Australia) and in several Spanish graduate courses and masters coordinated by the UPM and the University of Valladolid. He has also been co-organizer of the 8th edition of the international course on stable isotopes in the biosphere (2018) and has **co-supervised Dr Yazen Al-Salman' PhD** at WSU (08/02/2022), who is currently [PostDoc at Wageningen University & Research](#), together with Prof Oula Ghannoum. Dr Cano's outstanding research career was certificated by the Ministry of Universities with the award **I3 certificated** (2022). Since January 2023 he started the prestigious **Ramón y Cajal fellowship** also at INIA-CSIC (Spain) and is the **IP** of the project PIE-RyC CSIC (2023) to study **mechanisms of thermotolerance in tree forest species (100.000 €)** and **IP** Spanish National Program (ACLIMTREE)' (PID2023-147450OA-I00) (**143.750 €**), see in part C (projects).

Dr Cano's **main lines of research** focus on photosynthesis and its diffusive and biochemical limitations in response to environmental drivers (water stress, high temperatures and increased CO₂), chlorophyll fluorescence, modeling gas fluxes and isotopes between the canopy and the atmosphere, primary metabolites indicative of stress, energy balance and remote sensing in higher plants. Due to his outstanding contributions and broad knowledge in plant physiology to abiotic stresses, Dr Cano was recently **invited to write several reviews** on C₃ and C₄ photosynthesis and adaptation to climate change: Tansley Review for *New Phytologist*, *Journal of Integrative Plant Biology* (JIPB), *Annals of Botany* (that are in progress).

Dr. Cano publishes his research in high impact journals such as *Trends in Plant Science* (IF 22.1), *New Phytologist* (x4) (IF 10.3) and *Plant, Cell and Environment* (x5) (IF 7.9), *JEB*, *The Plant Journal*. The average impact factor (IF) of his publications is 7.0, although it has increased to 9.3 in the last 5 years. Currently he has published a total of 27 articles in SCI indexed journals (**76 % published in the first decile, D1**), being first or senior author in >40 %, and five book chapters in prestigious publishers (e.g. Springer). Dr. Cano's publications were cited 1266 times (Figure 1) (1842 according to google scholar) and averaged 46 citations/article (WoS) obtaining an [H-index of 21 \(GS\)](#) or [19 \(WoS\)](#). He is a regular reviewer for about 25 international scientific journals (e.g. *New Phytologist*, *Plant Physiology*, *PCE*, *PNAS*) and reviewer since 2017 for *Agencia Nacional de Evaluación y Prospectiva (ANEP)* of Spanish National research projects (**AEI**) in the area Plant Biology, Animal and Ecology (8 projects) and for the Israeli Ministry of Innovation, Science and Technology. He is part of the **Editorial Board** of *Plants* since 2020 (IF = 4.7, Q1 Plant Science), and **Associate Editor** for the Photosynthesis and Metabolism section of the journal *Frontiers in Plant Physiology* and has edited **special issues** for *Frontiers in Forests and Global Change* (IF = 4.3, Q1 Forestry) and [Plants](#).



Part C. RELEVANT MERITS (sorted by typology)



C.1. Ten most relevant publications in peer review journals of the JCR

Al-Salman Y, Ghannoum O, **Cano FJ**. 2023. Midday water use efficiency in sorghum is linked to faster stomatal closure rate, lower stomatal aperture and higher stomatal density. *The Plant Journal* **115** (6): 1661-1676 (I. F. (2022) = 7.20 rank 17/238 Plant Science, Q1 D1, cites: 2 GS). Design experiment, analyze data, and get funding (PhD advisor).

Al-Salman Y, Ghannoum O, **Cano FJ**. 2023. Elevated [CO₂] negatively impacts C₄ photosynthesis under heat and water stress without penalizing biomass. *Journal of Experimental Botany* **74** (9): 2875–2890 (I. F.= 7.38, rank 15/239 Plant Science, Q1 D1, cites: 2 GS). Design experiment, analyze data, and get funding (PhD advisor).

Al-Salman Y*, **Cano* FJ**, Pan L, Koller F, Piñeiro J, Jordan D, Ghannoum O. 2023. Anatomical drivers of stomatal conductance in sorghum lines with different leaf widths grown under different temperatures. *Plant, Cell & Environment* **46** (7), 2142-2158 **Equal contribution* (I. F. = 7.95, rank 13/239 Plant Science, Q1 D1, cites: 3 GS). Measuring and modelling leaf gas exchange, conceptualization, and get funding (PhD advisor).

Pan L, George-Jaeggli B, Borrell A, Jordan D, Koller F, Al-Salman Y, Ghannoum O, **Cano FJ**. 2022. Coordination of stomata and vein patterns with leaf width underpins water-use efficiency in a C₄ crop. *Plant, Cell & Environment* **45** (6): 1612-1630 (I. F.= 7.95, rank 13/240 Plant Science, Q1 D1, cites: 18 GS) (AC ; 8/8). Development energy balance model to estimate the interrelationships between leaf temperature, transpiration and water use efficiency.

López R, **Cano FJ**, Martin-StPaul NK, Cochard H, Choat B. 2021. Coordination of stem and leaf traits define different strategies to regulate water loss and tolerance ranges to aridity. *New Phytologist* **230** (2): 497-509. (I. F.= 10.29, rank 7/235 Plant Science, Q1 D1, cites: 55 GS) (2/5). Application of the SurEau model to account for water stress tolerance in two tree species.

Cano FJ, Sharwood RE, Cousins AB, Ghannoum O. 2019. The role of leaf width and conductances to CO₂ in determining water use efficiency in C₄ grasses. *New Phytologist* **223**(3): 1280-1295. (I. F.= 8.51, rank 7/235 Plant Science, Q1 D1, cites: 41 GS) (1/4). This article was highlighted in the journal: [New Zealand Herald](#) and [Hawkesbury gazette](#). It was included in the list of studies for the year of the [ARC Research highlights website](#). Modeling photosynthesis limitations in C₄ plants (analytical method to solve up to 8 relative limitations).

Earles JM, Buckley TN, Brodersen CR, Busch FA, **Cano FJ**, Choat B, Evans JR, Farquhar GD, Harwood R, Huynh M, John GP, Miller ML, Rockwell FE, Sack L, Scoffoni C, Struik PC, Wu A, Yin X and Barbour MM. 2019. Embracing 3D complexity in leaf carbon-water exchange. *Trends in Plant Science* **24**(1): 15-24. (I. F.= 18.31, rank 2/239 Plant Science Q1 D1, cites: 60 GS) (5/19). [Cover Image](#). [F1000Prime Recommended](#), covered by [Phys.org](#), [Science Daily](#), [RDmagazine](#). 3D leaf modeling for calculating CO₂ and water vapor fluxes.

Cano FJ, López R & Warren CR. 2014. Implications of the mesophyll conductance to CO₂ for photosynthesis and water use efficiency during long-term water stress and recovery in two contrasting Eucalyptus species. *Plant, Cell and Environment* **37**(11):2470-2490. (I. F.= 6.96, rank 7/204 Plant Science Q1 D1, cites: 110 GS) (1/3). Modeling of photosynthesis limitations in C₃ plants under water stress and upon recovery.

Cano FJ, Sánchez-Gómez D, Rodríguez-Calcerrada J, Warren CR, Gil L and Aranda I. 2013. Effects of drought on mesophyll conductance and photosynthetic limitations at different tree canopy layers. *Plant, Cell and Environment* **36** (11): 1961–1980. (I. F.= 5.91, rank 10/199 Plant Science Q1 D1, cites 119 GS) (1/6). Measured at Hayedo de Montejo tower.

Warren CR, Aranda I and **Cano FJ**. 2011. Responses to water stress of gas exchange and metabolites in *Eucalyptus* and *Acacia* spp. *Plant, Cell and Environment* **34**: 1609–1629. (I. F.= 5.22, rank 12/190 Plant Science Q1 D1, cites: 145 GS). The first article that combines leaf metabolomics with diffusive and biochemical limitations to photosynthesis.



C.2. Congress (> 36 total)

Cano FJ, López R, Rodríguez-Calcerrada J, Warren CR, Gil L, Aranda I. *Talk*. Revealing within tree sensitivity to drought in temperate forest species differing in shade tolerance. *XX International Botanical Congress (IBC 2024)*. Madrid, 21-27 July 2024.

Cano FJ, López R, Rodríguez-Calcerrada J, Warren CR, Gil L, Aranda I. Short oral by poster. Gas exchange of sun and shade-developed leaves is differently affected by drought: implications to scaling up models and silvicultural recommendations. *XXVI IUFRO World Congress*. Stockholm, 23 - 29 June 2024.

Cano FJ, Al-Salman Y, Warren CR, Watson-Lazowski A, Ghannoum O. *Talk*. Leaf width: a trait that regulates both water-use efficiency and tolerance to high temperatures in C₄ grasses. *The Society for Experimental Biology Centenary Conference*, Edinburgh, UK, July **2023**.

Cano FJ, López R & Warren CR. Short oral by poster. New equations to model CO₂ fluxes inside the leaf: implications for the so called “mesophyll conductance” and FvCB model of photosynthesis. CO₂ Assimilation in Plants from Genome to Biome. *Gordon Research Conference*. Lucca (Italy) April 30 - May 5, **2017**.

C.3. Research projects.

2024 - 2027 ‘*Acclimation and adaptation of photosynthetic metabolism to rising temperatures in tree species (ACLIMTREE)*’ (PID2023-147450OA-I00). Proyectos de generación de conocimiento 2023. Ministerio de Ciencia, Innovación y Universidades (Spain). Project leader: **Francisco Javier Cano** (143.750 €).

2023 - 2026 ‘*Thermotolerance and climate change in forest species*’ (PIE-RYC2021 ref 20234AT029). ‘Proyectos Intramurales Especiales’ by CSIC. Project leader: **Francisco Javier Cano** (INIA/CSIC) (100.000 €).

2023 - 2025 ‘*Climate change vulnerability of Scots pine in National Parks: metabolomic and functional approach to forest dieback*’ (MetForDec) SPIP2022-02948. National Parks (Spain). Project leader: Albert Rivas (INIA/CSIC) (122.893 €). Modeling photosynthesis limitations

2019 -2021 ‘*Mechanisms for heat stress tolerance in Sorghum bicolor*’. Agility Research Grants by the Australian Research Council (ARC, Australia). Project leader: Dr **Francisco Javier Cano (WSU)** (\$50000). Design, measurements, and writing (Pan *et al.*, 2022; Al-Salman *et al.*, 2023).

2016 -2017 ‘*Leaf width as a selective trait for improving water use efficiency and drought and heat tolerance in Sorghum bicolor*’. Early and Mid-Career Researchers Seed Funding Research Grants by ARC CoETP (Australia). Project leader: Dr **Francisco Javier Cano (WSU)** (\$15000). Design, measurements, and writing (Cano *et al.* 2019).

2012 -2015 ‘*Ecophysiological and epigenetic issues of the response to water stress in forest species: Fagus sylvatica L. as a case study (ECOFISEPI) AGL2011-25365*’. Ministry of Economy and Competitiveness (Spain). Project leader: Dr Ismael Aranda (108.900 €). Measurements of gas exchange and hydraulics (Cano *et al.*, 2013) (Aranda *et al.*, 2015).

2008 -2011 ‘*Environmental limitations in a marginal beech population: challenges for the species in the face of the current changing climate CGL2007-66066-C04-03/BOS*’. Ministry of Education (Spain). Project leader: Dr Ismael Aranda (90.750 €). Estimate the mesophyll conductance to CO₂ upon an increase in light intensity (Cano *et al.* 2011) (Aranda *et al.* 2012)