



CURRICULUM VITAE (CVA)

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

Part A. PERSONAL INFORMATION

Part A. PERSONAL INFORMATION		CV date	28/01/2025
First name	Antonio		
Family name	Díaz Espejo		
Gender (*)	Male	Birth date (dd/mm/yyyy)	26/07/1972
Social Security, Passport, ID number	26223264K		
e-mail	a.diaz@csic.es	https://www.iras.csic.es/rec/	
Open Researcher and Contributor ID (ORCID) (*)		B-5361-2008 0000-0002-4711-2494	

A1. Current position

Position	Research Scientist		
Initial date	2008		
Institution	Spanish National Research Council (CSIC)		
Department/Center	IRNAS	https://www.iras.csic.es/	
Country	Spain	Teleph. number	635194070
Key words	Ecophysiology, modelling, stomatal conductance, photosynthesis		

A2. Previous positions (research activity interruptions, art. 14.2.b))

None

A3. Education

PhD, Licensed, Graduate	University/Country	Year
Licenciado de Biología	Sevilla	1996
Doctor en Biología	Sevilla	2000

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

Since I joined the Plant Ecophysiology and Irrigation group (ECOVER) in 1997 to pursue my doctoral thesis, my main objective has been to study plant responses to water stress, particularly in woody species of agronomic interest. This has led me to lead one of ECOVER's research lines, focused on the physiological mechanisms of drought response, aiming to establish the foundations for rational deficit irrigation management. However, since 2024, I have shifted my research focus toward studying the regulation of stomatal opening as a key aspect of controlling plant water status and the water and carbon fluxes in leaves.

Throughout my scientific career, I have always benefited from competitive grants and contracts, including a predoctoral FPI fellowship, a postdoctoral Marie Curie fellowship at the University of Reading (UK), and a Ramón y Cajal contract at IRNAS-CSIC. In 2008, I secured a permanent position as a Tenured Scientist at CSIC within IRNAS-CSIC, and in 2019, I was promoted to Research Scientist. Over this period, I have gained expertise in various aspects of the soil-plant-atmosphere system, including, beyond plant ecophysiology, soil physics, SVAT (Soil-Vegetation-Atmosphere Transfer) models, and production and quality assessment. I have served as Principal Investigator (PI) in five projects funded by the Spanish Ministry, two European projects (one of which I coordinated), and 10 industry contracts.

I would like to highlight that most of the 108 SCI journal publications in my CV focus on studying the fundamental physiological mechanisms of plant responses to water stress. This focus has allowed me to publish in high-impact journals despite working in the field of agriculture. Seven



of these publications are currently Highly Cited according to ISI WOK, and three were classified as Hot Papers at the time of their publication.

The ecophysiology research line I lead has positively impacted the visibility of the ECOVER group both nationally and internationally, thanks to our physiologically driven approach to agronomic challenges. The application of complex physiological models to deficit irrigation management has been key in securing most of our R&D contracts with industry. Additionally, I established a Scientific-Technical Service for Plant Ecophysiology Measurements at IRNAS, which has held ISO 9001 Quality Certification since 2020, providing services to companies.

Part C. RELEVANT MERITS (*sorted by typology*)

C.1. Publications (*see instructions*)

- Hernandez-Santana V. (AC), Rodriguez-Dominguez C.M., Perez-Romero L.F., Sebastian Azcona J., Díaz-Espejo A. 2023. Role of hydraulic traits on stomatal regulation of transpiration under different vapour pressure deficits across five Mediterranean tree crops. *Journal of Experimental Botany*, 74: 4597-4612.
- Torres-Ruiz J.M. (AC), Cochard H., Delzon S.,... 2023. Plant hydraulics as a central hub integrating plants, crops and ecosystem functions. *New Phytologist*, 241: 984-999.
- Perez-Arcoiza, A. Hernandez-Jimenez, M.L., Sicardo, M.D., Hernandez-Santana, V., Diaz-Espejo, A., Martinez-Rivas, J.M. 2022. Carbon supply and water status regulate fatty acid and triacylglyceron biosynthesis at transcriptional level in photosynthetic oil fruit mesocarp. *Plant, Cell and Environment*, 45:2366–2380
- C.M. Rodriguez-Dominguez, A. Forner, S. Martorell, B. Choat, R. Lopez, J.M.R. Peters, S. Pfautsch, S. Mayr, M.R. Carins Murphy, S.A.M. McAdam, F. Richardson, A. Diaz-Espejo, V. Hernandez-Santana, P.E. Menezes-Silva, J.M. Torres-Ruiz & L. Sack. 2022. Leaf water potential measurements using the pressure chamber: Synthetic testing of assumptions towards best practices for precision and accuracy. *Plant, Cell & Environment*, 1– 25.
- Hernandez-Santana V, Perez-Arcoiza A, Gomez-Jimenez MC, Diaz-Espejo A. 2022. Disentangling the link between leaf photosynthesis and turgor in fruit growth, *Plant Journal* 107, 1788-1801.
- Franco-Navarro JD, Rosales MA, Cubero-Font P, Calvo P, Álvarez R, Diaz-Espejo A, Colmenero-Flores JM. 2019. Chloride as macronutrient increases water use efficiency by anatomically-driven reduced stomatal conductance and increased mesophyll diffusion to CO₂. *Plant Journal*, 99, 815–831.
- Rodriguez-Dominguez C.M., Hernandez-Santana V., Buckley T.N., Fernández J.E., Diaz-Espejo A. 2019. Sensitivity of leaf turgor to air vapour pressure deficit correlates with maximum stomatal conductance. *Agricultural and Forest Meteorology*, 272 - 273: 156 - 165.
- V. Hernandez-Santana, P. Diaz-Rueda, A. Diaz-Espejo, M.D. Raya-Sereno, S. Gutiérrez-Gordillo, A. Montero, A. Perez-Martin, J.M. Colmenero-Flores & C.M. Rodriguez-Dominguez. (2019). Hydraulic traits emerge as relevant determinants of growth patterns in wild olive genotypes under water stress. *Frontiers in Plant Science*, 10: 1 - 15. 2018
- Hernandez-Santana, V, Fernandes, R.D.M., Perez-Arcoiza A., Fernández, J.E., Garcia, J.M., Diaz-Espejo, A. 2018. Relationships between fruit growth and oil accumulation with simulated seasonal dynamics of leaf gas exchange in the olive tree. *Agricultural and Forest Meteorology*, 256-257: 458-469.
- Diaz-Espejo A, Hernandez-Santana V. 2017. The phloem-xylem consortium: until death do them part. *Tree Physiology*, 37: 847-850
- Rodriguez-Dominguez CM, Buckley TN, Egea G, de Cires A, Hernandez-Santana V, Martorell S, Diaz-Espejo A. 2016. Most stomatal closure in moderate drought can be explained by stomatal responses to leaf turgor. *Plant, Cell and Environment*, 36: 725-735.
- Flexas, J; Diaz-Espejo, A; Conesa, M; Coopman, R; Douthe, C; Gago, J; Gallé, A; Galmes, J; Medrano, H; Ribas-Carbo, M; Tomás, M; Niinemets, Ü. 2016. Mesophyll conductance to



- CO₂ and Rubisco as targets for improving intrinsic water use efficiency in C₃ plants. *Plant, Cell and Environment*, 39: 965-982.
- Hernandez-Santana, V., Rodriguez-Dominguez, C.M., Fernandez, J.E., Diaz-Espejo, A. 2016. Role of leaf hydraulic conductance in the regulation of stomatal conductance in almond and olive in response to water stress. *Tree Physiology*, 36: 725-735
- Hernandez-Santana, V., Fernandez, J.E., Rodriguez-Dominguez, C.M., Romero R., Diaz-Espejo, A. 2016. The dynamics of radial sap flux density reflects changes in stomatal conductance in response to soil and air water deficit. *Agricultural and Forest Meteorology*, 218: 92-101.
- Flexas, J., Diaz-Espejo, A. 2015. Interspecific differences in temperature response of mesophyll conductance: food for thought on its origin and regulation. *Plant, Cell and Environment*, 38, 625 – 628
- Buckley TN, Diaz-Espejo A. 2015. Partitioning changes in photosynthetic rate into contributions from different variables. *Plant, Cell and Environment*, 38: 1200–1211
- Buckley TN, Díaz-Espejo A. 2015. Reporting estimates of maximum potential electron transport rate. *New Phytologist*, 205: 14-17
- Torres-Ruiz J.M., A. Diaz-Espejo, A. Perez-Martin, V. Hernandez-Santana. 2014. Role of hydraulic and chemical signals in leaves, stems and roots in the stomatal behaviour of olive trees under water stress and recovery conditions. *Tree Physiology*, 35: 415-424
- Buckley T.N., S. Martorell, A. Diaz-Espejo, M. Tomás, H. Medrano. 2015. Is stomatal conductance optimised over both time and space in plant crowns? A field test in grapevine (*Vitis vinifera*). *Plant, Cell and Environment*, 37: 2707–2721.
- Perez-Martin A., C. Michelazzo, J.M. Torres-Ruiz, J. Flexas, J.E. Fernández, L. Sebastiani, A. Diaz-Espejo. 2014. Regulation of photosynthesis, stomatal and mesophyll conductance under water stress acclimation and recovery in olive trees: correlation with gene expression of carbonic anhydrase and aquaporins. *Journal of Experimental Botany*, 65: 3143-3156
- Diaz-Espejo. 2013. New challenges in modeling photosynthesis: temperature dependencies of Rubisco kinetics. *Plant, Cell and Environment*, 36: 2104-2107
- Martorell S., Antonio Diaz-Espejo, Hipólito Medrano, Marilyn C. Ball, Brendan Choat. 2014. Rapid hydraulic recovery in *Eucalyptus pauciflora* after drought: linkages between stem hydraulics and leaf gas exchange. *Plant, Cell and Environment*, 37: 617–626.

C.2. Congress

I have attended 85 International Congresses or Workshop and 23 National ones. Among them, I highlight I have been invited to give 18 plenary lectures or keynote lectures and organised 7 International Congresses.

C.3. Research projects

Mecanismos fisiológicos de control de la transpiración y la fotosíntesis en el olivo y la vid y su relación con la adaptación a la sequía y al riego de recuperación. Bases para la mejora de la eficiencia del uso del agua en estos cultivos y la optimización del riego deficitario. (AGL2005-00220/AGR) 2006-2008. 85.680 euros IP: A Díaz Espejo

Consecuencias del control estomático de la transpiración en árboles frutales con riego deficitario ocasionado por las limitaciones impuestas por la conductividad hidráulica del sistema suelo-planta y las señales hormonales desde raíces. Desarrollo de un modelo mecanístico integrador. AGL2009-11310/AGR 2010-2012 180.000 euros IP: A Díaz Espejo

Riego deficitario controlado del olivar de alta densidad: programación automática basada en la fisiología de la planta y en la economía de manejo del cultivo. AGL2012-34544. 2013-2015. 120.000 euros IP: JE Fernández Luque

Bases fisiológicas del equilibrio entre la carga de frutos y el área foliar en olivares en seto.

AGL2015-71585-R. 2016- 2018 165.000 euros IPs: A Díaz Espejo & JE Fernández Luque
Operationalizing the increase of water use efficiency and resilience in irrigation (OPERA)
European project ERA-NET JPI-Waterworks, PCIN-2017-002 2017-2019. 133.000 euros
(total 1.075.098 euros para 8 partners). COORDINATOR: Marius Heinen Workpackage IP:
Antonio Díaz-Espejo

Fundamentos fisiológicos de un nuevo método para el manejo del riego deficitario en frutales
MICINN, Programa I+D, RTI2018-098961-B-I00. Enero 2019-Diciembre 2021. 175.450
euros IPs: Antonio Díaz Espejo y José Enrique Fernández Luque.

Smart biohydrib phyto-organisms for environmental in situ monitoring. European
Commission, Programa H2020-FETPROACT-2020-2. Enero 2021-Diciembre 2024.
3.744.192,50 € (CSIC: 656.680,00 €). IP CSIC: Antonio Díaz Espejo

A novel plant-based approach to estimate irrigation water needs of orchards for an optimal
water management (IRR IWELL). AEI España, European Commission, Programa PRIMA
2020. Junio 2021-Mayo 2024. 1.038.941,00 € (CSIC: 200.000,00 €). COORDINATOR:
Antonio Díaz Espejo.

Fundamentos fisiológicos de un nuevo método para el manejo del riego deficitario en frutales
/ MICINN, Programa I+D, RTI2018-098961-B-I00 / Enero 2019-Diciembre 2021 / 175.450
euros / IPs: Antonio Díaz Espejo y José Enrique Fernández Luque.

RESILIFruit: Resilience strategies for fruit tree survival under drought / Ministerio de Ciencia,
Innovación y Universidades / 2024-2028 / 275.000 euros / IP: José Manuel Torres Ruiz -
Investigador: Antonio Díaz Espejo

Physiological Bases for the Application of Deficit Irrigation Strategies in Digitalized
Plantations (TED2021-129500B-I00) / Ministerio de Innovación y Ciencia / Junio 2021-
Mayo 2024 / 126.000 euros / IPs: Antonio Díaz Espejo y Virginia Hernández Santana

C.4. Contracts, technological or transfer merits

Investigación y asesoramiento de interpretación de sensores en plantas para la optimización
del riego y nutrición en el cultivo de viña y tomate. Verde-Smart Corporación S.L. Ref.
VAPC 20135588. Diciembre 2013 - Junio 2015 72.529,82 euros

Puesta a punto de un modelo que permita cuantificar el porcentaje de limitación de
fotosíntesis en cultivos de riego deficitario de viña Tinta causado por estrés climático e
hídrico. Bodegas Emilio Moro S.L. Ref. VAPC 20141652. 28 Febrero 2014 - Abril 2015
38.720 euros

Análisis de ácido abscísico en hojas de maíz e interpretación de datos de sondas Zim de
turgencia en hojas de maíz. BASF Española S.L. Ref. VAPC 20142054. 22 Abril 2014 - 30
Noviembre 2014 49.610 euros

Physiological interpretation of the read outs of ZIM probes in the field. BASF Española S.L.
Ref. VAPC 20158875. 1 Marzo 2015 - 30 Octubre 2015 116.765 euros

Physiological interpretation of stress levels in corn in the field at different developmental
stage. BASF Española S.L. Ref. VAPC 20162467. 30 Abril 2016 - 31 Diciembre 2016
67.500 euros

Physiological interpretation of stress levels in corn in the greenhouse. BASF Española S.L.
Ref. VAPC 20163711. 15 Junio 2016 - 30 Noviembre 2016 24.625 euros

TERRA ACQUA: Estrategias para potenciar la síntesis de compuestos saludables en el
olivar. Cortijo de Gadiana S.L. Ref. VAPC 20164884. 1 Julio 2016 - 30 Abril 2019 30.000
euros

Continuous and automatic measurement of stomatal conductance in intact maize plants and
photosynthesis modelling. BASF Española S.L. Ref. VAPC 20166086. 1 Octubre 2016 - 31
Marzo 2017 36.000 euros