

## Part A. PERSONAL INFORMATION

CV date 13-09-2022

First and Family name	Luisa Gallardo Pino		
Social Security, Passport, ID number		Age	
Researcher numbers	Researcher ID	C-3668-2015	
	Orcid code	0000-0002-9031-8762	

### A.1. Current position

Name of University/Institution	University of Almeria		
Department	Agronomy		
Address and Country	Escuela Superior de Ingeniería, Universidad de Almería, Ctra. Sacramento S/N, La Cañada de San Urbano, 04120 Almería		
Phone number	+34 636 775 975	E-mail	<a href="mailto:mgallard@ual.es">mgallard@ual.es</a>
Current position	Full Professor	From	04-06-2009
Espec. cód. UNESCO	310205, 310702, 310305		
Palabras clave	Crop models, DSS, greenhouses, fertigation, vegetables, irrigation, nitrogen, N monitoring		

### A.2. Education

PhD	University	Year
Agricultural Engineer	University of Córdoba	1985
PhD in Agronomy	University of Córdoba	1990

### A.3. JCR articles, h Index, thesis supervised...

Number of Research "sexenios": 5 (last granted 2019)  
 Number of PhD thesis directed last 10 years: 5  
 Total number of citations: 2176 (Scopus, 6 August 2021)  
 Total publications first quartile (Q1): 44  
 H Index: 29 (Scopus, 6 August 2021)  
 Total number of JCR articles: 56

## Part B. CV SUMMARY (max. 3500 characters, including spaces)

During my academic career I have published 52 JCR articles, of which 41 are Q1. Since 2010, I have participated in 3 EU projects, 6 consecutive projects of the National/State Plan, 2 INIA projects, and 2 regional project having been IP in four of these projects. My scientific career has been influenced by my 5-year postdoctoral period in leading international centres such as CSIRO (Perth, Australia, 2 years) and the University of California, Davis (3 years). The main achievement of my CV has been to establish from zero an internationally recognised research program (The UAL N and Irrigation Lab, <https://w3.ual.es/GruposInv/nitrogeno/index.shtml>).

Since 2000, my research activity has been focused on (i) irrigation management in greenhouse vegetable crops by monitoring soil and plant water status with sensors and by determining crop evapotranspiration, (ii) development and adaptation of simulation models, for vegetable crops grown in greenhouses with fertigation, and their application to DSS used to optimize the management of irrigation and nitrogen fertilization, and (iii) the reduction of nitrate leaching in the greenhouse system of South-Eastern Spain by monitoring crop N status in the plant/crop and in soil. One of the main achievements has been the development of the VegSyst model, a practical model that requires few inputs, from which the VegSyst-DSS software for the management of fertigation in greenhouses has been developed. The work of monitoring crop N status has focused on the use of optical sensors (reflectance and fluorescence sensors, chlorophyll meters) and agronomic approaches (e.g. nitrate measurements in sap). The research lab that we created has a leading international profile; we are regularly active in various international forums (conferences, EUVRIN network), and every year we host, in our lab, several international researchers and postgraduate students from various countries (France, Italy, Brazil, China, Uruguay, Mexico etc.). Like the rest of our lab, I regularly participate in technology transfer events for the local sector. During 2018, I made 4 such presentations.

My current teaching activity is focused on the bilingual teaching of several subjects of modelling, crop physiology and water use in the Masters in Intensive Mediterranean Horticulture of the UAL. I have directed 9 PhD thesis, and in the last 4 years, 7 final year projects for undergraduate and 5 of Masters Students. In relation to administrative responsibilities, for two years (2013 and 2014), I was a member of the commission on accreditation of full professors of Engineering of the ANECA. I have been responsible for creating and managing the Research Group AGR224 " Intensive Horticultural Farming Systems "of the University of Almeria since 2002. Our research group has obtained several projects for scientific equipment financed by FEDER that have allowed us to have a fully-equipped greenhouse in the experimental farm of the university, and laboratory and field equipment that was necessary for the development of our research program.

## **Part C. RELEVANT MERITS**

### **C.1. Most relevant publications**

1. Peña-Fleitas, M.T., **Gallardo, M.**, Padilla, F.M., Rodríguez, A., Thompson, R.B. 2021. Use of a portable rapid analysis system to measure nitrate concentration of nutrient and soil solution, and plant sap in greenhouse vegetable production. *Agronomy* 11(5): 819. <https://doi.org/10.3390/agronomy11050819>
2. Rodríguez, A., Peña-Fleitas, M.T., Padilla, F.M., **Gallardo, M.**, Thompson, R.B. 2021. Petiole sap nitrate concentration to assess crop nitrogen status of greenhouse sweet pepper. *Scientia Horticulturae* 285: 110157. <https://doi.org/10.1016/j.scienta.2021.110157>
3. Grasso, R., Peña-Fleitas, M.T., **Gallardo, M.**, Thompson, R.B., Padilla, F.M. 2021. Tillage effects on soil properties, crop responses and rooting pattern of sweet pepper (*Capsicum annuum*) grown in soil in greenhouse. *Spanish Journal of Agricultural Research* 19(2): e0902. <https://doi.org/10.5424/sjar/2021192-17004>.
4. **Gallardo, M.**, Cuartero, J., Andújar de la Torre, L., Padilla, F.M., Segura, M.L., Thompson, R.N. 2021. Modelling nitrogen, phosphorus, potassium, calcium and magnesium uptake, and uptake concentration, of greenhouse tomato with the VegSyst model. *Scientia Horticulturae* 279: 109862. <https://doi.org/10.1016/j.scienta.2020.109862>

5. Rodríguez, A., Peña-Fleitas, M.T., **Gallardo, M.**, de Souza, R., Padilla, F.M., Thompson. 2020. Sweet pepper and nitrogen supply in greenhouse production: Critical nitrogen curve, agronomic responses and risk of nitrogen loss. *European Journal of Agronomy* 117: 126046.
6. de Souza, R., Peña-Fleitas, M.T., Thompson, R.B., **Gallardo, M.**, Padilla, F.M. 2020. Assessing performance of vegetation indices to estimate nitrogen nutrition index in pepper. *Remote Sensing* 12(5): 763.
7. de Souza, R., Grasso, R., Peña-Fleitas, M.T., **Gallardo, M.**, Thompson, R.B., Padilla, F.M. 2020. Effect of cultivar on chlorophyll meter and canopy reflectance measurements in cucumber. *Sensors* 20(2): 509.
8. **Gallardo, M.**, Padilla, F.M., Peña-Fleitas, M.T., de Souza, R., Rodríguez, A., Thompson, R.B. 2020. Crop response of greenhouse soil-grown cucumber to total available N in a Nitrate Vulnerable Zone. *European Journal of Agronomy* 114: 125993.
9. de Souza, R., Peña-Fleitas, M.T., Thompson, R.B., **Gallardo, M.**, Grasso, R., Padilla, F.M. 2019. The use of chlorophyll meters to assess crop N status and derivation of sufficiency values for sweet pepper. *Sensors* 19(13): 2949.
10. Castro, A.J., López-Rodríguez, M.D., Giagnocavo, C., Gimenez, M., Céspedes, L., La Calle, A., **Gallardo, M.**, et al., 2019. Six collective challenges for sustainability of Almería greenhouse horticulture. *International Journal of Environmental Research and Public Health*, 16 (21), art. no. 4097.

## C.2. Research projects and grants

1. GO INV-DSS. Desarrollo y uso de una herramienta digital de gestion del riego/fertirriego en cultivos hortícolas en invernadero. FEADER (Fondo Europea Agrícola de Desarrollo Rural) and Junta de Andalucía. Duration: 2021-2023. PI at UAL: S. Bonachela 48,711 €.
2. Integrated salinity, irrigation and nitrogen management to ensure yield and minimise nitrate leaching from vegetables grown with moderately saline water (P18-RT-2516). Proyectos de Excelencia, Junta de Andalucía, 2018. Duration: 2020-2022. PI en la UAL M. Gallardo. 106.224 €
3. Innovative Greenhouse Support System in the Mediterranean Region: efficient fertigation and pest management through IoT based climate control (iGUESS-MED). Grant Agreement Number 1916- iGUESSMED. Partnership for Research and Innovation in the Mediterranean Area Programme (**PRIMA**) Call 2019 Section 1 Farming IA. **EU H2020**. Duration: 2020-2024. PI at UAL: M. Gallardo 180.000 €.
4. Development of the Web-based VEGSYST-DSS for the management of irrigation and N in horticultural crops and the calculation of the C and N footprint (Coordinated Project, subproject 2- RTI2018-095298-R-C33). National Institute of Agricultural and Food Research and Technology (**INIA**), Duration: 2019-2022, PI: C. Giménez, 90.750 € (subproject).
5. Effect of the cultivar on the plant monitoring of the nutritional status in nitrogen of crops (NCULTIVAR). (Ref: RTI2018-099429-B-I00). Ministry of Economy and Competitiveness, "Plan Estatal de I+D+I"; Duration: 2019-2022. PI: R. Thompson, 133.100 €

6. Networking European Farms to Enhance Cross Fertilisation and Innovation Uptake through Demonstration (NEFERTITI), (Ref: 772705). **EU H2020** Call: RUR-12-2017. Duration: 2018-20, PI: C. Giagnocavo 267,882€ (UAL).
7. Transfer of innovative techniques for sustainable water use in fertigated crops (FERTINNOWA). (REF SEP-210267684). **EU H2020**, Topic WATER-4b-2015 call for thematic networks for "Water management solutions for agricultural sector". Type of action: CSA, Duration: 2016-2018, PI: R. Thompson, 85.468€ UAL.
8. Monitoring with proximal optical sensors and agronomic techniques to optimize N management and pepper yield. (Ref. AGL2015-67076-R). Ministry of Economy and Competitiveness, "**Plan Estatal de I+D+I**"; Duration: 2016-2018. PI: R. Thompson, 150.000 €
9. Use of optical sensors and simulation models to optimize nitrogen management in horticultural crops (Ref: AGL2012-39036-C03-01). Ministry of Economy and Competitiveness, "**Plan Nacional de I+D+I**", Duration: 2012-2015, PI: M. Gallardo, 100.000€
10. The efficient use of nitrogen in agricultural rotations (Coordinated Project, subproject 4-Ref. RTA2008-00081-C5-04). National Institute of Agricultural and Food Research and Technology (**INIA**), Duration: 2009-2011, PI: C. Giménez, 78.980 € (subproject).

### **C.3. Contracts**

Proximal optical sensors to evaluate the nitrogen status of a sweet pepper crop. Contract with Zeraim Gedera (Syngenta group). PI: R. Thompson. Duration: 2014-2016 75.183€

### **C.4. Patents**

M. Gallardo., R.B. Thompson, C. Giménez, F.M. Arrabal. 2016. Registration of the Software program VegSyst-DSS for irrigation and fertilizer recommendations (Ref. RTA-222-16).

### **C.5. Editorial responsibilities and evaluation committees**

- Chair of the Advisory Committee for Field 5, Natural Sciences of the National Commission for the Evaluation of Research Activity for 2020 and 2021.
- Associate editor of the Spanish Journal of Agricultural Research during 2014-2016
- Regular evaluator of JCR articles in leading journals (Agricultural Water Management, Irrigation Science, Agricultural Systems, Science of the Total Environment, Agronomy Journal, etc.)
- Member of the panel of the ANECA evaluators of the program of accreditation of full professors of Engineering for the period 2013 and 2014
- President of the panel of ANECA of the program of evaluation of research merits of professors of natural sciences since 2020.
- Evaluator of ANEP projects with several evaluations/year, during 2008 to 2018
- Member of the commissions for the evaluation of the programs Ramón y Cajal in 2013 and Juan de la Cierva in 2017 and Juan de la Cierva Incorporation 2019.
- Member of the panel of evaluators for the Mobility program Salvador de Madariaga and José Castillejo, 2014.
- National coordinator for Agriculture of the evaluation panel for the Mobility program Salvador de Madariaga and José Castillejo, 2019.