Date of the CVA	14/02/2020

Section A. PERSONAL DATA

Name and Surname	José Manuel Peña Barragán		
DNI/NIE/Passport		Age	
Researcher's identification number	Researcher ID	K-4201-2014	
	Scopus Author ID	8908632800	
	ORCID	0000-0003-4592-3792	

A.1. Current professional situation

Institution	Spanish National Research Council (CSIC)		
Dpt. / Centre			
Address			
Phone		Email	
Professional category	Cientifico Titular (Tenured Scientist)	Start date	2018
UNESCO spec. code	250407 - Satellite geodesy; 310299 - Other; 310304 - Crop protection; 310315 - Weed control; 319900 - Other specialty agricultural		
Keywords			

A.2. Academic education (Degrees, institutions, dates)

Bachelor/Master/PhD	University	Year
Civil Engineer (3-years Degree)	Universidad de Córdoba	2008
Agricultural and Forestry Engineering Doctoral Program	Universidad de Córdoba	2006
Agricultural Engineer (5-years Degree)	Universidad de Córdoba	2000

A.3. General quality indicators of scientific production

Sexenios: 2 (2002-2007 and 2008-2013).
Quinquenios: 3 (2002-2006, 2007-2011 and 2012-2016).
Doctoral Theses supervised: 2 (2011 and 2017), +2 in progress.
Master´s Thesis supervised: 3 (2014, 2017 and 2019), +1 in progress.
H index and cites: 30 and 3547 (Google scholar), 25 and 2218 (Scopus), 25 and 2367 (WoS).
- 59 papers (plus 2 under review) published in SCI journals (50 in Q-1 and 4 in Q-2).
- 20 papers published in popular science journals. - 10 book chapters.
- 98 contributions to Congresses.
- 35 contributions to Workshops.
- Co-author of 7 patents and 5 registered computer software, included in a CSIC technological offer.

Section B. SUMMARY OF THE CURRICULUM

Tenured Scientist at the Institute of Agricultural Sciences, CSIC
Education: MS in Agricultural Eng. (2000), BS in Civil Eng. (2008) and Doctoral degree (2006) from the University of Cordoba.
Scientific production: 59 papers (plus 2 under review) published in SCI journals (50 in Q-1 and 4 in Q-2), 20 papers published in popular science journals, 10 book chapters, and 98 contributions to Congresses and 35 to Workshops. Co-author of 7 patents and 5 registered computer software, included in a CSIC technological offer. H index and cites: 30 and 3467 (Google scholar), 26 and 2411 (Scopus), 24 and 2170 (WoS).
Projects: Principal Investigator (PI) of the National Projects AGL-APLICA (2018-2020, budget 151.250€), AGL-MAPEO (2015-2017, budget 160.000€) and of the 4-year 7FP European Project CIG-TOAS (2011-2015, budget 100.000€). Participant researcher in the 7FP Large-scale European Project RHEA (2010-2014, budget 7M€), with 17 partners of 8 countries, being in charge of two objectives of the WP3 (Perception systems). In total, I have participated in 19

research projects (6 International and 13 National). **Students´ supervision:** I have supervised various students and I am the co-director of two Doctoral Theses, presented in 2011 and 2017, respectively.

International stays: Post-doctoral stay in the University of California, Davis (2-years MEC-Fulbright grant, 2008-2010), as well as seven short-stays at UC Berkeley-USA (2011), Cornell University-USA (2014 and 2016), University of Florida-USA (2015), NIBIO-Norway (2017) and Clemson University-USA (2017 and 2019).

Main awards:

1) “Pierre C. Robert - Best Young u42 Scientist" awarded by the International Society of Precision Agriculture (Sacramento, 2014).

2) "Proyecto Desafios" awarded by MAGRAMA and Expo Milano (Milan, 2015).

3) 1st and 2nd Best Papers in the 10th and 9th European Conferences of Precision Agriculture hosted in Tel-Aviv (2015) and Lleida (2013), respectively.

4) "Jose Luis Labrandero" award, for the best paper published in the "Revista de Teledetección" journal in 2014-2015 (Seville, 2015).

5) "Accesit" to the Best Doctoral Thesis, awarded by the Andalusian Association of Agricultural Engineers (Cordoba, 2006).

Other activities:

1) Editorial boards: Associate editor (2016-current) of Photogrammetry Engineering & Remote Sensing Journal (ranked in Q2), official journal of the American Society of Remote Sensing (ASPRS); Guest editor in two special issues (RS in vineyards, Vegetation monitoring with UAVs) of the Remote Sensing journal (ranked in Q1); Subject editor (Agricultural engineering section, 2015-2019) and Associate editor (Agricultural engineering section, 2013-2014, and Crop protection section, 2011-2012) of the Spanish Journal of Agricultural Research (ranked in Q2). 2) Chairman in two international conferences (Pisa, 2012; Madrid, 2014) and two national conferences (La Laguna, 2011; Seville, 2015).

3) Invited speaker at UC Davis (2008), UC Berkeley (2011), University of Florida (2015), Cornell University (2016), Chinese Academy of Social Sciences (Beijing, 2015), Symposium de Sanidad Vegetal (Sevilla, 2015), and Encuentro Phytoma sobre La Vid y el Vino (Valencia, 2015).

4) Keynote seminar in the 2016 International Congress of Weed Science (Prague, 2016).

5) Broad diffusion in TV (Telediario RTVE, Agroesfera, Canal Sur), Radio (Onda Cero, M80), Newspapers (El Confidencial, ABC, La Razón, La Vanguardia, etc), Internet (EU Horizon magazine, CSIC, Agrodigital, etc).

Section C. MOST RELEVANT MERITS (ordered by typology)

C.1. Publications

1 **Scientific paper**. Ana Isabel de Castro; et al. 2020. Mapping Cynodon dactylon infesting cover crops with an automatic Decision Tree-OBIA procedure and UAV imagery for precision viticulture Remote Sensing. MDPI. 12-1, pp.56.

2 **Scientific paper**. Daniel Freeman; et al. 2019. Watson on the Farm: Using Cloud-based Artificial Intelligence to Identify Early Indicators of Water Stress Remote sensing. MDPI. 11-22, pp.2645.

3 **Scientific paper**. Francisco José Ostos Garrido; et al. 2019. High-throughput phenotyping of bioethanol potential in cereals by using multi-temporal UAV-based imagery Frontiers in Plant Science. Frontiers Media SA. 10, pp.948.

4 **Scientific paper**. Francisco Manuel Jiménez Brenes; et al. 2019. Automatic UAV-Based Detection of Cynodon dactylon for Site-Specific Vineyard Management PLoS ONE. 14-6, pp.e0218132.

5 **Scientific paper**. Victor Rueda Ayala; et al. 2019. Comparing UAV-Based Technologies and RGB-D Reconstruction Methods for Plant Height and Biomass Monitoring on Grass Ley Sensors. MDPI. 19-3, pp.535.

6 **Scientific paper**. Isabel Luisa Castillejo González; et al. 2019. Assessment of the persistence of Avena sterilis L. patches in wheat fields for site-specific sustainable management Agronomy. MDPI. 9-1, pp.30.

7 **Scientific paper**. Jorge Torres Sánchez; et al. 2018. Mapping the 3D structure of almond trees using UAV acquired photogrammetric point clouds and OBIA Biosystems Engineering. Elsevier. 176, pp.172-184.
8 **Scientific paper**. Ana Isabel de Castro; et al. 2018. Mapping crop calendar events and phenology-related metrics at the parcel level by object-based image analysis (OBIA) of MODIS-NDVI time-series: a case study in Central California Remote Sensing. MDPI. 10-11, pp.1745.
9 **Scientific paper**. José Manuel Peña; et al. 2018. Estimating tree height and biomass of a poplar plantation with image-based UAV technology AIMS Agriculture and Food. AIMS press. 3-3, pp.313-326.
10 **Scientific paper**. César Fernández-Quintanilla; et al. 2018. Is the current state of the art of weed monitoring suitable for site-specific weed management in arable crops? Weed Research. Wiley Online Library. 58-4, pp.259-272.
11 **Scientific paper**. Ana Isabel de Castro; et al. 2018. An automatic Random Forest-OBIA algorithm for early weed mapping between- and within- crop-row using UAV imagery Remote Sensing. MDPI. 10-2, pp.285.
12 **Scientific paper**. Jorge Torres Sánchez; et al. 2018. Assessing UAV-collected image overlap influence on computation time and digital surface model accuracy in olive orchards Precision Agriculture. Springer. 19-1, pp.115-133.
13 **Scientific paper**. Francisco Manuel Jiménez Brenes; et al. 2017. Quantifying pruning impacts on olive tree architecture and annual canopy growth by using UAV-based 3D modelling Plant Methods. BioMed Central. 13, pp.55.
14 **Scientific paper**. Francisca López Granados; et al. 2016. Object-based early monitoring of a grass weed in a grass crop using high resolution UAV-imagery Agronomy for Sustainable Development. Springer. 36-4, pp.67.
15 **Scientific paper**. Francisca López Granados; et al. 2016. Early season weed mapping in sunflower using UAV technology: variability of herbicide treatment maps against weed thresholds Precision Agriculture. Springer. 17-2, pp.183-199. ISSN 1385-2256.
16 **Scientific paper**. Francisco Javier Mesas Carrascosa; et al. 2015. Assessing optimal flight parameters for generating accurate multispectral orthomosaicks by UAV to support site-specific crop management Remote Sensing. MDPI AG. 7-10, pp.12793-12814.
17 **Scientific paper**. María Pérez Ortiz; et al. 2015. A semi-supervised system for weed mapping in sunflower crops using unmanned aerial vehicles and a crop row detection method Applied Soft Computing. Elsevier. 37, pp.533-544.
18 **Scientific paper**. Jorge Torres Sánchez; Francisca López Granados; José Manuel Peña. 2015. An automatic object-based method for optimal thresholding in UAV images: application for vegetation detection in herbaceous crops Computers and Electronics in Agriculture. 6-114, pp.43-52.
19 **Scientific paper**. José Manuel Peña; et al. 2015. Quantifying efficacy and limits of Unmanned Aerial Vehicle (UAV) technology for weed seedling detection as affected by sensor resolutions Sensors. MDPI AG. 15, pp.5609-5626.
20 **Scientific paper**. José Manuel Peña; et al. 2014. Object-based image classification of summer crops with machine-learning methods Remote Sensing. MDPI. 6-6, pp.5019-5041.
21 **Scientific paper**. Jorge Torres Sánchez; et al. 2014. Multi-temporal mapping of the vegetation fraction in early-season wheat fields using images from UAV Computers and Electronics in Agriculture. Elsevier. 103, pp.104-113.
22 **Scientific paper**. José Manuel Peña; et al. 2013. Weed mapping in early-season maize fields using object-based analysis of unmanned aerial vehicle (UAV) images PLOS ONE. PUBLIC LIBRARY SCIENCE. 8-10, pp.e77151.
23 **Scientific paper**. Maegen Simmonds; et al. 2013. Underlying causes of yield spatial variability and potential for precision management in rice systems Precision Agriculture. Springer. 14, pp.512-540.
24 **Scientific paper**. Jorge Torres Sánchez; et al. 2013. Configuration and specifications of an unmanned aerial vehicle (UAV) for early site specific weed management PLOS ONE. PUBLIC LIBRARY SCIENCE. 8-3, pp.e58210.

25 **Scientific paper**. Ana Isabel de Castro; et al. 2012. Airborne multi-spectral imagery for mapping cruciferous weeds in cereal and legume crops Precision Agriculture. Springer. 13-3, pp.302-321.
26 **Scientific paper**. Francisco Fernández Navarro; et al. 2012. Parameter estimation of q-Gaussian Radial Basis Functions Neural Networks with a hybrid algorithm for binary classification Neurocomputing. T. Heskes. 75, pp.123-134.
27 **Scientific paper**. José Manuel Peña Barragán; et al. 2011. Object-based crop identification using multiple vegetation indices, textural features and crop phenology Remote Sensing of Environment. Elsevier. 115-16, pp.1301-1316.
28 **Book chapter**. César Fernández-Quintanilla; et al. 2019. Use of DSS for site-specific weed management Decision support systems for weed management. Springer.

C.2. Participation in R&D and Innovation projects

1 AGL2017-83325-C4-1-R, Aplicación de nuevas herramientas a la investigación y a la gestión de malas hierbas en sistemas agrícolas característicos de la zona Centro (APLICA) Ministerio de Economía, Industria y Competitividad. Programa Estatal de Investigación, Desarrollo e Innovación Orientada a los Retos de la Sociedad. José Manuel Peña Barragán. (INSTITUTO DE CIENCIAS AGRARIAS). 01/01/2018-31/12/2020. 151.250 €. Principal investigator.
2 PRX19-00346, Caracterización de cultivos leñosos mediante fusión de tecnologías geoespaciales Ministerio de Ciencia, Innovación y Universidades. Salvador de Madariaga. José Manuel Peña Barragán. (Clemson University). 02/09/2019-30/11/2019. 11.281 €. Principal investigator.
3 201840I096, Evaluación espacio-temporal de la competencia entre cultivos y malas hierbas mediante teledetección con UAV Ministerio de Ciencia, Innovación y Universidades. Programa de Incorporación al CSIC. José Manuel Peña Barragán. (INSTITUTO DE CIENCIAS AGRARIAS). 01/12/2018-30/11/2019. 5.000 €. Principal investigator.
4 AGL2014-52465-C4-4, Desarrollo y evaluación de tecnologías basadas en UAV y OBIA para la detección de malas hierbas y optimizar su gestión (MAPEO) Ministerio de Economía y Competitividad. Programa Estatal de Investigación, Desarrollo e Innovación Orientada a los Retos de la Sociedad. Francisca López Granados. (Instituto de Agricultura Sostenible). 01/01/2015-31/12/2017. 160.000 €. Principal investigator.
5 CIG-293991, New remote sensing technologies for optimizing herbicide applications in weed-crop systems (TOAS) European Union. FP7-PEOPLE-2011. José Manuel Peña Barragán. (Instituto de Agricultura Sostenible). 01/09/2011-31/08/2015. 100.000 €. Principal investigator.
6 AGL-2011-30442-C02-01, Detección Temprana de Malas Hierbas para control localizado: aplicaciones y perspectivas del uso de vehículos no tripulados Ministerio de Ciencia e Innovación. Francisca López Granados. (Instituto de Agricultura Sostenible). 01/01/2012-31/12/2014. 150.000 €.
7 FP7-245986, Robot fleets for highly effective agriculture and forestry management (RHEA) European Union. FP7-NMP-2009-LARGE-3. Pablo González de Santos. (Instituto de Agricultura Sostenible). 01/08/2010-31/07/2014. 8.961.658 €.

C.3. Participation in R&D and Innovation contracts

Toma de imágenes de espectro visible con UAV de parcela de cereal IFAPA Alameda del Obispo. José Manuel Peña Barragán. 13/01/2020-13/07/2020. 3.121,2 €.

C.4. Patents

1 L. García Torres; J.J. Caballero Novella; D. Gómez Candón; J.M. Peña Barragán; F. López Granados; M. Jurado Expósito. 201431127. Procedure for the classification of crops and others land uses based in census parcels and multitemporal remote images Spain. 28/07/2014. Consejo Superior de Investigaciones Científicas.
2 L. García Torres; J.J. Caballero Novella; D. Gómez Candón; F. López Granados; J.M. Peña Barragán; M. Jurado Expósito. CROPCLASS-2.0 software para la clasificación de cultivos en imágenes multitemporales remotas a nivel de parcela del censo agrario Spain. 26/05/2014. Consejo Superior de Investigaciones Científicas. ESRI-ENVI-EXELIS.

3 L. García Torres; J.J Caballero Novella; D. Gómez Candón; Montserrat Jurado Expósito; J.M. Peña Barragán; F. López Granados. Registro Publico Notarial Protocolo 1391/2012. ARIN software: Automatic Remote Image Normalization Spain. 16/11/2012. Consejo Superior de Investigaciones Científicas. ESRI-ENVI-EXELIS.

4 L. García Torres; D. Gómez Candón; J.J Caballero Novella; M. Jurado Expósito; J.M. Peña Barragán; F. López Granados. AUGEO 2.0: Software for the semiautomatic georeferentiation of remote images using Artificial Terrestrial Targets Spain. 02/06/2010. Consejo Superior de Investigaciones Científicas.