

Pedro Andrade-Sanchez, Ph.D.

EDUCATION

- Ph.D. (2004) Biological and Agricultural Engineering Dept. University of California Davis, USA.
M.S. (1997) International Agricultural Development Program. University of California Davis, USA.
B.S. (1987) Agronomy. Autonomous University of Chihuahua, México.

APPOINTMENTS

- August 2007 – date. Assistant Professor / Assistant Specialist at University of Arizona, Agricultural and Biosystems Engineering Department. Maricopa Ag. Center.
- February 2007 – August 2007. Assistant Research Professor. Center for Precision Agricultural Systems. Washington State University. Prosser, WA., USA.
- April 2006 - January 2007. Research Associate. Center for Precision Agricultural Systems. Washington State University. Prosser, WA., USA.
- December 2003 - April 2006. Full time Researcher. National Institute of Agricultural Research (INIFAP). Torreón, Coahuila, México.
- September 2005 - December 2005. Adjoint Professor, Chapingo University. Department of Arid Zones (URUZA). Bermejillo, Durango, México.
- April 2000 - June 2003. Teaching Assistant, Biological and Agricultural Engineering Department. University of California Davis, USA.
- July 1999 - Oct. 2002. Research Assistant, Biological and Agricultural Engineering Department. University of California Davis, USA.
- September 1987 – July 1993. Farm Manager for production of fresh vegetables, Global Produce S.A. Colonia Nuevo León. Baja California, México.

PATENTS

- Soil profile force measurement using an instrumented tine. United States Patent No. US 6,834,550 B2. December 2004.
- Plant height measurement system for mobile platforms. Provisional Patent Application No. UA11-135. August 2011.

HONORS AND AWARDS

- 2009 Superior Paper Award. American Society of Agricultural and Biological Engineers (ASABE). June 2009.
- Graduate Student Research Award, 3rd place in Ph.D. category. American Society of Agricultural and Biological Engineers (ASABE). July 2005.
- Jastro Shields Research Award. University of California Davis (1996 and 2000).

SYNERGISTIC ACTIVITIES

- Arizona representative to NCERA-180 project “Site-Specific Crop Management” since 2007. Committee Chair in 2012.
- Participant in monthly radio broadcasts of WSU Small Farms Extension Program on topics about advanced technologies available to small farmers in the State of Washington. Radio KDNA 91.9 FM, Yakima, WA.
- Chair of Soil Dynamics Research Committee (PM-45) 2005-06. Member of PM-54 (Precision Agriculture), and ED-208 (Extension). American Society of Agricultural and Biological Engineers (ASABE).
- Reviewer of peer-reviewed manuscripts submitted to journals: Transactions of the ASABE, Biosystems Engineering, Computers and Electronics in Agriculture, and Soil & Tillage Research.

RESEARCH FUNDING AS PRINCIPAL INVESTIGATOR (last 5 years)

1. Development of economically viable variable rate P application protocols for desert vegetable production systems. 2013-2015. California Department of Food and Agriculture. Fertilizer Research and Education Program.
2. Precision canopy and water management of specialty crops through sensor-based decision making. 2010-2013. USDA Specialty Crop Research Initiative Program.
3. Field-level analysis of yield variability in irrigated cotton in Arizona – 2011-2012-2013 – AZ Cotton Growers Association.
4. Non-destructive estimation of cotton plant growth and nitrogen status – 2010-2011-2012 – Cotton Inc.
5. Determination of optimal planting configuration of durum wheat and barley in Central Arizona. 2011-2012-2013 Arizona Grain Research and Promotion Council
6. Field distribution of soil and plant variables affecting wheat grain protein content and yield: A field-scale study to improve farm management. 2010-2011-2012. Arizona Grain Research and Promotion Council
7. Sensor-based management of mid-season N fertilizer in durum wheat. 2011-2012-2013. Arizona Grain Research and Promotion Council.
8. Technology use characterization of selected field crops in Arizona. 2008 HATCH project.

PUBLICATIONS - Peer-reviewed articles:

1. Andrade-Sanchez P., M.A. Gore, J.T. Heun, K.R. Thorp, A.E. Carmo-Silva, A.N. French, M.E. Salvucci, and J.W. White. 2013. Development and evaluation of a field-based high-throughput phenotyping platform. *Functional Plant Biology Journal* (in press).
2. Kaggwa-Asiimwe R., P. Andrade-Sanchez, G. Wang. 2013. Plant architecture influences growth and yield response of upland cotton to population density. *Field Crops Research* 145: 52-59.
3. Carmo-Silva E.A., M.A. Gore, P. Andrade-Sanchez, A.N. French, D.J. Hunsaker, M.E. Salvucci. 2012. Decreased CO₂ availability and inactivation of Rubisco limit photosynthesis in cotton plants under heat and drought stress in the field. *Environmental and Experimental Botany*. 83: 1-11.
4. Bagiotto-Rosato O., P. Andrade-Sanchez, S.P. Sebastiao-Guerra, and C.A. Costa-Cruscio. 2012. Use of reflectance and fluorescence sensors to test the effect of Nitrogen fertilizer rates on biomass production and productivity of cotton. *Brasilian Agricultural Research*. 47 (8): 1133-1141
5. White J.W., P. Andrade-Sanchez, M.A Gore, K.F Bronson, T.A. Coffelt, M.M. Conley, K.A. Feldmann, A.N. French, J.T. Heun, D.J. Hunsaker, M.A. Jenks, B.A. Kimball, R.L. Roth, R.J. Strand, K.R. Thorp, G.W. Wall, G. Wang. 2012. Field-based phenomics for plant genetics research. *Field Crops Research* 133: 101-112.
6. Andrade-Sanchez P., Upadhyaya S., Plouffe C., Poutre B. 2008. Development and field evaluation of a field-ready compaction profile sensor for real-time applications. *Applied Engineering in Agriculture*. 24 (6): 743-750.
7. Andrade-Sanchez P., Upadhyaya S., Jenkins B. 2008. Development, construction and field evaluation of a soil compaction profile sensor. *Transactions of the ASABE*. 50(3): 719-725.
8. Sudduth K., Chung S., Andrade-Sanchez P., Upadhyaya S. 2008. Field comparison of two prototype soil strength sensors. *Computers and Electronics in Agriculture*. 61(1): 20-31.
9. Sakai K., Andrade-Sanchez P., Upadhyaya S. 2004. Periodicity and stochastic hierarchical orders of soil cutting force data detected by a developed "Autoregressive Error Distribution Function" (AREF). *Transactions of the ASAE*. 48(6): 2039-2046.
10. Andrade-Sanchez P., Upadhyaya S., Jenkins B., Agüera J. 2004. Evaluation of a capacitance based soil moisture sensor for real-time applications. *Transactions of the ASAE*. 47(4): 1281-1287.
11. Andrade P., Jenkins B. 2003. Identification of patterns of farm equipment utilization in two agricultural regions of central and northern México. *Agricultural Engineering International: The CIGR Journal of Scientific Research and Development*. Vol V. 1-12 (invited overview paper).

Peer-reviewed Extension Bulletins:

1. Andrade-Sanchez P. and Heun J.T. 2013. Operation of yield monitors in Central Arizona: Grains and cotton. Bulletin AZ1598. The University of Arizona - Cooperative Extension. Tucson, Arizona 85721
2. Andrade-Sanchez P. and Heun J.T. 2013. Yield monitoring technology for irrigated cotton and grains in Arizona: Hardware and software selection. Bulletin AZ1596. The University of Arizona - Cooperative Extension. Tucson, Arizona 85721
3. Wang G., R. K. Asiimwe, and Pedro Andrade. 2011. Growth and yield response to plant population of two cotton varieties with different growth habits. Cotton Research & Outreach 2010-2011 Bulletin AZ1548. The University of Arizona - Cooperative Extension. Tucson, Arizona 85721
4. Andrade-Sanchez P. and Heun J.T. 2012. From GPS to GNSS: Enhanced functionality of GPS-integrated systems in agricultural machines. Bulletin AZ1558. The University of Arizona - Cooperative Extension. Tucson, Arizona 85721
5. Andrade-Sanchez P. and Heun J.T. 2011. A general guide to Global Positioning Systems (GPS) – Understanding operational factors for agricultural applications in Arizona. Bulletin AZ1553. The University of Arizona - Cooperative Extension. Tucson, Arizona 85721
6. Andrade-Sanchez P. and Heun J.T. 2010. Things to know about applying precision agriculture technologies in Arizona. Bulletin AZ1535. The University of Arizona - Cooperative Extension. Tucson, Arizona 85721
7. Andrade-Sanchez P. and Heun J.T. 2010. Understanding technical terms and acronyms used in precision agriculture. Bulletin AZ1534. The University of Arizona - Cooperative Extension. Tucson, Arizona 85721
8. Nolte K., Siemens M., and Andrade-Sanchez P. 2010. Integrating variable rate technologies for soil-applied herbicides in Arizona vegetable production. Bulletin AZ1538. The University of Arizona - Cooperative Extension. Tucson, Arizona 85721

Book Chapters:

1. Andrade-Sanchez P. and Upadhyaya S. 2007. Book Chapter: *Using GIS and on-the-go soil strength sensing technology for variable-depth tillage assessment*. GIS Applications for Agriculture, Volume I, by Francis J. Pierce. CRC Press-Taylor and Francis Group, Boca Raton, Florida.
2. Andrade-Sanchez P. and Chancellor W.J. 2007. Chapter 3, Part IV: *Empirical Determination of Draft, Energy and Soil Condition in Tillage Studies*. Advances in Soil Dynamics Volume III. Shrinivasa K. Upadhyaya Editor. American Society of Agricultural and Biological Engineers. St. Joseph, Michigan.

Conference Papers (last five years):

1. Andrade-Sanchez P. and J.T. Heun. 2013. Sensor-based estimation of cotton plant height: Potential for site-specific plant growth management. Paper No. 131668472. ASABE Annual Int. Meeting.
2. Andrade-Sanchez P., J.T. Heun, M.A. Gore, A.N. French, E. Carmo-Silva, M.E. Salvucci. 2012. Use of a moving platform for field deployment of plant sensors. Paper No. 121337985. ASABE Annual Int. Meeting.
3. Hunsaker DJ, French AW, Bautista EM, Thorp KR, Waller PM, Royer PD, Andrade-Sanchez P, and Heun JT. 2010. Spatial estimation of crop evapotranspiration, soil properties, and infiltrated water for scheduling cotton surface irrigations. Paper No. IRR10-8655. ASABE 5th National Decennial Irrigation Conference.
4. Gore M., French A., Andrade-Sanchez P., Salvucci M, Thorp K., Hunsaker D. Carmo-Silva E., and White J. 2010. High-Throughput Phenotyping the physiological responses of cotton to a hot, arid environment. CSSA Annual Int. Meeting.

5. Subramani J., Martin E., and Andrade-Sanchez P. 2010. Assessing irrigation BMP for water conservation - land leveling. Paper No. 109097. ASABE Annual Int. Meetng.
6. Oguri G., Andrade-Sanchez P., and Heun J. 2009. Potential use of the Veris apparent EC sensor to predict soil texture under the semi-arid conditions of Central Arizona. Paper No. 096488. ASABE Annual Int. Meetng.
7. Andrade-Sanchez P., Heun J., Wang G., and Zarnstorff M. 2009. Characterizing the response of irrigated cotton to hail damage through canopy reflectance measurements in Arizona. Paper No. 096482. ASABE Annual Int. Meetng
8. Andrade P., Upadhyaya S., Plouffe C, and Poutre B. 2008. Potential Use of the UCDavis Soil Compaction Profile Sensor (UCD-SCPS) for Site-Specific Tillage Applications. Paper No. 083927. ASABE Annual Int. Meetng.
9. Andrade Sanchez P., Pierce F.J., and Elliot T.V. 2007. Performance assessment of wireless sensor networks in agricultural settings. Paper No. 073076. ASABE Annual Int. Meetng.