**CHRISTOPHER M. MONTES**

USDA-ARS Global Change and Photosynthesis Research Unit

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**Education:**

University of Illinois at Urbana-Champaign BA International Studies 2009

University of Illinois at Urbana-Champaign PhD Plant Biology 2020

**Research and Work Experience:**

2020-present USDA-ARS Research Plant Physiologist, Urbana IL (GS11)

Genetic mapping of plant responses to climate change

2018 KWS, Wheat Breeding Intern, Champaign IL

2012-2017 Field Manager, Soybean Free Air Concentration Enrichment (SoyFACE) Facility, University of Illinois, Urbana, IL

2010-2012 Research Technician, Department of Plant Biology, University of Illinois, Urbana, IL

**Current Areas of Research:**

High-throughput phenotyping, Crop responses to climate change, Genetics, Photosynthesis

**Awards and Certifications:**

2016 ASA, CSSA and SSSA Graduate Student Leadership Conference

2015 Tucson Plant Breeding Institute, Modules 1 & 2

2014 Plant Biology Graduate Research Enhancement Fund

**Professional Memberships:**

2021-present North American Plant Phenotyping Network

2018-present Champaign County Farm Bureau

2014-present American Society of Agronomy, Crop Science Society of America, Soil Science Society of America

2013-present American Society of Plant Biologists

2013-2020 Plant Biology Association of Graduate Students

**Service and Outreach:**

Peer Review New Phytologist, Environmental and Experimental Botany, Plant, Cell & Environment, Agricultural and Forest Meteorology, Frontiers in Plant Biology, Remote Sensing (MDPI) and Agronomy (MDPI)

Leadership Vice-Chair – Young Ag Leaders – Champaign County Farm Bureau Founding member – Science and Spirits – Interdepartmental talk and poster competition at University of Illinois

Secretary, Outreach Coordinator, Graduate Affairs Committee Representative – Plant Biology Association of Graduate Students

**Peer-reviewed Publications**

*Under review or revision*

1. Burroughs CH, **Montes CM**, Moller CA, Mitchell NG, Michael AM, Peng B, Kimm H, Pederson T, Lipka AE, Bernacchi CJ, Guan K, Ainsworth EA (2023) Physiological and developmental mechanisms of soybean yield loss to a high temperature gradient. Journal of Experimental Botany, revision submitted.

*Published*

1. **Montes CM**, Fox C, Sanz-Sáez A, Serbin SP, Kumagai E, Krause MD, Xavier A, Specht JE, Beavis WD, Bernacchi CJ, Diers BW, Ainsworth EA (2022) High-throughput characterization, correlation, and mapping of leaf photosynthetic and functional traits in the soybean (*Glycine max*) nested association mapping population. *Genetics*. 221 (2): iyac065. DOI 10.1093/genetics/iyac065
2. Fu P, **Montes CM**, Siebers MH, Gomez-Casanovas N, McGrath JM, Ainsworth EA, Bernacchi CJ (2022) Advances in field-based high-throughput photosynthetic phenotyping. *Journal of Experimental Botany*. 73 (10): 3157-3172. DOI 10.1093/jxb/erac077
3. Kumagai E, Burroughs CH, Pederson TL, **Montes CM**, Peng B, Kimm H, Guan K, Ainsworth EA, Bernacchi CJ (2022) Predicting biochemical acclimation of leaf photosynthesis in soybean under in-field canopy warming using hyperspectral reflectance. *Plant Cell & Environment*. 45 (1): 80-94. DOI 10.1111/pce.14204
4. **Montes CM**, Demler HJ, Li S, Martin DG, Ainsworth EA (2022) Approaches to investigate crop responses to ozone pollution: from O3-FACE to satellite-enabled modeling. *The Plant Journal*. 109 (2): 432-446. DOI 10.1111/tpj.15501
5. Kimm H, Guan K, Jiang C, Miao G, Wu G, Suyker AE, Ainsworth EA, Bernacchi CJ, **Montes CM**, Berry JA, Yang X, Frankenberg C, Chen M, Köhler P (2021) A physiological signal derived from sun-induced chlorophyll fluorescence quantifies crop physiological response to environmental stresses in the U.S. Corn Belt. *Environmental Research Letters*. 16: 124051. DOI 10.1088/1748-9326/ac3b16
6. Meacham-Hensold K, Fu P, Wu J, Serbin S, **Montes CM**, Ainsworth EA, Guan K, Dracup E, Pederson T, Driever SM, and Bernacchi CJ (2020) Plot level rapid screening for photosynthetic parameters using proximal hyperspectral imaging. *Journal of Experimental Biology*. 71 (7): 2312:2328. DOI 10.1093/jxb/eraa068
7. Digrado A, Mitchell NG, **Montes CM**, Dirvanskyte P, Ainsworth EA (2020) Assessing diversity in canopy architecture, photosynthesis, and water-use efficiency in cowpea magic population. *Food and Energy Security*. 9 (4). DOI 10.1002/fes3.236
8. Choquette N, Ogut F, Wertin T, **Montes CM**, Sorgini C, Morse AM, Brown PJ, Leakey ADB, McIntyre L, Ainsworth EA (2019) Uncovering hidden genetic variation in photosynthesis of field-grown maize under ozone pollution. *Global Change Biology*. 25 (12): 4327-4338. DOI 10.1111/gcb.14794
9. Meachum-Hensold K, **Montes CM**, Wu J, Guan K, Pederson T, Moore C, Ainsworth EA, Raines C, Brown K, Bernacchi C (2019) High-throughput field phenotyping using hyperspectral reflectance and partial least squares regression (PLSR) reveals genetic modifications to photosynthetic capacity. *Remote Sensing of Environment*. 231: 111176. DOI 10.1016/j.rse.2019.04.029
10. Bishop K, Lemonnier P, Quebedeaux J, **Montes CM**, Leakey ADB, Ainsworth EA (2018) Similar photosynthetic response to elevated carbon dioxide concentration in species with different phloem loading strategies. *Photosynthesis Research*. 137 (3): 453-464. DOI 10.1007/s11120-018-0524-x
11. Sanz-Sàez A, Koester RP, Rosenthal DM, **Montes CM**, Ort DR, Ainsworth EA (2017) Leaf and canopy scale drivers of genotypic variation in soybean response to elevated carbon dioxide concentration. *Global Change Biology*. 23: 3908-3920. DOI 10.111/gcb.13678.
12. Yendrek CR, Erice G, **Montes CM**, Tomaz T, Sorgini C, Brown PJ, McIntyre L, Leakey ADB, Ainsworth EA (2017) Elevated ozone accelerates loss of photosynthetic capacity in inbred and hybrid maize in a genotype-specific manner. *Plant Cell & Environment*. 40: 3088-3100. DOI 10.1111/pce.13075
13. Yendrek CR, Tomaz T, **Montes CM**, Cao YY, Morse AM, Brown PJ, McIntyre LM, Leakey ADB, Ainsworth EA (2016) High-throughput phenotyping of maize leaf physiology and biochemistry using hyperspectral reflectance. *Plant Physiology*. 173 (1): 614-626. DOI 10.1104/pp.16.01447.

**Invited Presentations**

1. **Montes CM** (2016) Introduction to ground-based hyperspectral measurements. *Invited talk*, EPSCoR – Hyperspectral Workshop, Iowa State University, Ames, IA.
2. **Montes CM** (2016) Hands-on, real-world processing. *Invited talk*, EPSCoR – Hyperspectral Workshop, Iowa State University, Ames, IA.
3. **Montes CM** (2021) Crops and a changing climate: lessons learned from FACE experiments. *Invited talk*. North Central Weed Science Society Annual Meeting, Grand Rapids, MI

**Talks, Posters, Abstracts & Proceedings**

1. **Montes CM**, Skoneczka JA, Nelson RL, Ainsworth EA. (2013) Improving soybean production in elevated ozone: selecting genotypes and understanding mechanisms of tolerance in the field. *Poster*, Department of Plant Biology Fall Welcome, Urbana, IL.
2. **Montes CM**, Skoneczka JA, Nelson RL, Brown PJ, Ainsworth EA. (2015) Soybean response to elevated ozone in a biparental mapping population. *Poster*, International Plant & Animal Genome XXIII, San Diego, CA.
3. **Montes CM,** Skoneczka JA, Nelson RL, Brown PJ, Ainsworth EA (2015) Utilizing a biparental population to understand ozone tolerance and improve soybean productivity. *Talk*, Global Change and Photosynthesis Research Unit Group Meeting, Urbana, IL.
4. **Montes CM** (2017) SoyFACE: A Platform for Improving Crop Response to Global Atmospheric Change. *Talk*. University of Illinois & Dupont-Pioneer Plant Sciences Symposium, University of Illinois, Urbana, IL.
5. **Montes CM** (2021) Understanding the genetic underpinnings of photosynthetic traits in maize and soybean using leaf reflectance. *Poster*. North American Plant Phenotyping Network Annual Conference. Online.
6. **Montes CM**, Diers BW, Ainsworth EA (2021) High-throughput characterization, correlation, and mapping of leaf photosynthetic and functional traits in the soybean (*Glycine max*) nested association mapping population. *Talk*. Society for Experimental Biology’s 2021 Annual Conference, Online.
7. **Montes CM**, Diers BW, Ainsworth EA (2022) High-throughput characterization, correlation, and mapping of leaf photosynthetic and functional traits in the soybean (*Glycine max*) nested association mapping population. *Poster*. Rubisco Oxygenase: 50 Years of Progress and Looking into the Future, Urbana, IL.
8. **Montes CM** (2022) High-throughput characterization, correlation, and mapping of leaf photosynthetic and functional traits in the soybean (*Glycine max*) nested association mapping population. *Talk*. 2022 ASA-CSSA-SSSA International Annual Meeting, Baltimore, MD.