
Curriculum Vitae

Bruno BASSO

Department of Geological Sciences and W.K. Kellogg Biological Station
Michigan State University

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EDUCATION

2000 Ph.D. in Crop and Soil Sciences, Michigan State University

1992 *Laurea* in Agricultural Sciences, University of Naples Federico II, Italy

RESEARCH INTERESTS

- Water, carbon, nitrogen cycling and modeling in agricultural systems.
- Assessment of spatial and temporal variability of water, nutrients, and crop yield by integrating remote sensing data and crop system models.
- Impact of climate variability and change on agricultural production systems
- Food Security, Sustainable Intensification and Global Change Science
- Crop Yield Forecasting and Early Warning Systems

PROFESSIONAL APPOINTMENTS

2017 - Present University Foundation Endowed Professor, Dept. Earth and Environmental Sciences, MSU

2015 – Present Professor, Dept. Geological Sciences and W.K. Kellogg Biological Station, Michigan State University

2012 – 2015 Associate Professor, Dept. Geological Sciences and W.K. Kellogg Biological Station, Michigan State University

2008 – Present Adjunct Professor, Queensland University of Technology, Institute of Future Environment, Brisbane, Australia

2005 – 2012 Associate Professor with tenure, Dept. of Crop Systems, Forestry and Environmental Sciences, University of Basilicata, Italy

2000 – 2005 Assistant Professor, Dept. of Crop Systems, Forestry and Environmental Sciences, University of Basilicata, Italy

1996 – 2000 Graduate Research Assistant, Department of Crop and Soil Sciences, Michigan State University

1998 (8 months) Visiting Scholar, International Center for Maize and Wheat Improvement, El B́atan, Mexico, DF, Mexico

1997 (9 months) Visiting Scholar, International Crop Research Institute for the Semi-Arid Tropics, Patancheru, Andhra Pradesh, India

- 1994-1996 Technician, Homer Nowlin Chair, Crop and Soil Sciences, Michigan State University, East Lansing, MI, USA
- 1993 (6 months) Visiting scholar Cooperative Research Center for Soil Management CSIRO Waite Institute, Glen Osmond, SA, Australia

ACADEMIC AWARDS

- 2016 MSU Innovation of Year for GeoYield Software
- 2015 Fellow Soil Science Society of America
- 2014 Professor, National Scientific Habilitation, Italian Ministry of Education and Scientific Research
- 2013 Fellow of the American Society of Agronomy
- 2010 *Pierre Robert* Precision Agriculture Award - International Society of Precision Agriculture
- 2008 *L. Frederick Lloyd* Soil Teaching Award - Soil Science Society of America
- 2007 *L.R. Ahuja* Agricultural System Modeling Award - Soil Science Society of America

PATENTS

- 2014 U.S. Patent and Trademark Office No. 62/087,924. Bruno Basso “METHODS AND SYSTEMS FOR PRECISION CROP MANAGEMENT”. The disclosure relates to methods and related systems for precision crop modeling and management using in-season weather information to prepare mid-season, updated crop management plans. “CROP LAND EVALUATION USING CROP MODEL SYSTEMS”

PROFESSIONAL MEMBERSHIPS

- American Association Advancement of Science (AAAS)
- American Geophysical Union (AGU)
- American Society of Agronomy (ASA)
- Soil Science Society of America (SSSA)
- Crop Science Society of America (CSSA)

RECENT EXTERNAL FUNDING AT MICHIGAN STATE UNIVERSITY

2012- present

- 2014-2019 USDA National Institute of Food and Agriculture.
Title: Developing and promoting water-, nutrient-, and climate-smart technologies to help High Plains and Midwestern US agricultural systems adapt to climate and societal changes (**\$4,994,270**; Role: PI, with Co-PIs J., Butler, N. Brozovic; J Hatfield, D. Hyndman, J. Andresen, G.P. Robertson, P. Parker; J. Price; J. Zhao)
- 2015-2016 Michigan Corn Marketing Program.
Title: Beyond crop scouting: integrating remote sensing imagery with

- crop modeling to improve nitrogen management (\$44,000). Role Sole PI.
- 2014-2016 US Army Corp of Engineers.
Title: Quantifying the Spatial and Temporal Changes in San Clemente Island Vegetation Between 1985 and Present, Using Historical Imagery and Dynamic Plant Modeling (\$214,381; Role: PI 50% with Zwiernik M)
- 2013-2017 NSF Coupled Natural Human Systems-
Title: CNH: A Social-Ecological Analysis of Nitrogen in Agricultural Systems of the Upper Midwest (\$1,462,073; Role: Co-PI with Stuart D (PI), Robertson, GP, Zhao J. Marquat-Pyatt)
- 2013-2015 Bill And Melinda Gates Foundation
Title: Perennial grain crops for African smallholder farming systems (\$1,497,449; Role: Co-PI, with S. Snapp, PI; J. Messina, L. Smith-Olabisi L; R. Richardson)
- 2011-2015 USDA - National Institute of Food and Agriculture
Title: Climate Change, Mitigation, and Adaptation in Corn-based Cropping Systems (\$891,401; Role: Co-PI with Kravchencko A (PI).)
- 2014-2015 MTRAC – Michigan Translational Research and Commercialization
Title: GeoYields: An integrated systems approach to increase farmers' profitability and reduce environmental impact in row-crop agriculture. (\$100,000; Role: PI, no Co-PIs)
- 2014-2015 Corn Marketing Program of Michigan
Title: Improving Nitrogen Use Efficiency in corn using Unmanned Aerial Vehicle (UAV) linked to crop modeling and yield mapping technologies (\$35,000; Role: PI, no Co-PIs)
- 2015-2016 Corn Marketing Program of Michigan
Title: What can remote sensing tell us about water, nitrogen and phosphorous in corn. (\$36,734; Role: PI, no Co-PIs)
- 2014-2015. Corn Marketing Program of Michigan
Title: i-Salus: a web-based agronomic decision support system to help farmers optimize water and nutrients, increase resource use efficiency, and reduce environmental impact (\$33,000; Role: PI, no Co-PIs)
- 2014-2015. Michigan Wheat Program
Title: Optimizing Nitrogen Fertilizer Rates in Wheat Using Unmanned Aerial Vehicle (UAV) and Crop Modeling (\$19,000; Role: PI no Co-PIs)
- 2015-2016. Michigan Wheat Program
Title: Improving N management in Wheat using remote sensing

(\$24,000; Role: PI no Co-PIs)

2015-2016. Michigan Potato Industry Commission
Title: On-farm soil health research: with special references to bio-based systems (\$24,000; Role: PI no Co-PIs) – Preliminary approval

2012-2013. University of Florida and CIMMYT
Title: Wheat sensitivity to increasing temperatures in India and Sudan (\$11,500; Role: PI, no Co-PIs)

2013. Monsanto Italia
Title: Developing variable rate seeding maps to enhance resources use efficiency in maize (\$10,320; Role: PI, no Co-PIs)

RECENT EXTERNAL INTERNATIONAL GRANTS

2007 - present

2013-2016 Australian Department of Agriculture, Fishery and Forestry
Title: A simple indicator of potential N₂O loss from agricultural soils (AUD\$534,512; Role: PI, with QUT Adjunct Professor affiliation)

2012-2014. Italy Rural Development Plan for Campania Region
Title:- Sustainable irrigation strategies for corn production in the Sele valley (Euro 194,988; Role: PI; University of Basilicata previous affiliation)

2011- 2015 Italy-Israel Exchange Grant.
Title: Toward sustainable agricultural management using high-resolution X-band radar precipitation estimates.
(Euro, 245,000; Role Co-PI; University of Basilicata previous affiliation)

2011-2014. Research Programme of National Interest (PRIN) Italian Ministry of Education and Scientific Research
Title: ICFAR: Linking Long Term Observatories with Crop Systems Modeling For a better understanding of Climate Change Impact and Adaptation strategies for Italian Cropping Systems
(Euro 1,240,000; Role: Co-PI University of Basilicata previous affiliation)

2012-2014 MACSUR/FACCE European Union:
Title: Impacts of climate change on European agriculture.
(Euro 27,000 Role: Co-PI University of Basilicata previous affiliation)

2009- 2010 Region of Emilia Romagna. Italy. Sustainable biofuel production: future scenarios of Biogas, Bioethanol and biodiesel. (Role: Co-PI Euro 25.000)

- 2009 -2010 Alsia-Regione Basilicata Decision Support Systems for Crop Management in Basilicata. Funded by (Role: PI Euro 90,000)
- 2008.-2010 Research Programme of National Interest (PRIN) Italian Ministry of Education and Scientific Research Title: Relationship between nitrogen management and yield in wheat (Role: PI Euro 250.000)
- 2007-2011 FISR - Funded by Italian Ministry of Research MIUR
Title: Sustainable Feed production to improve water buffalo feed. (Role: Co-Pi Euro 300.000)
- 2007-2009 European Union Archimed-Intereg - “Monitoring Desertification”. Funded by EU Interreg program Role: PI Euro 235.000)
- 2007-2010 European Union FP7 FUTUREFARM – “ The farm of tomorrow”. – Role: Co-PI (EU \$2.000.000)
- 2007-2010 Italian Ministry of Agriculture SICERME - “Integrated Cereal Systems in South Italy”. Role: Co-PI (Euro 45.000)
- 2007-2010 Regione Veneto Agricoltura. AGRICOLTURA DI PRECISIONE - Precision and Conservation Agriculture in Veneto”. Role: Co-PI Euro 30.000)
- 2007-2009 Research Programme of National Interest (PRIN) Italian Ministry of Education and Scientific Research – “Ecohydrology”. Role: Co-PI 37.000 Euro)

PUBLICATIONS

Google Scholar, H index 25; i10-index 51; since 2011 45; ISI H Index 19 in May 2016)
Publications in ISI journals with Impact Factor

(*Denotes student supervised or student at another institution who received significant input to the publication)

1. Books

Basso, B., L. Sartori, M. Bertocco. 2005. Agricoltura di Precisione: concetti teorici ed applicazioni pratiche. Collana Libri, L’informatore Agrario. Verona. pp

(This book has also been translated in Spanish: Manual de agricultura de precision: conceptos teoricos y application pratica (Handbook of Precision Agriculture: Theoretical Concepts and Practical Uses). Coordinadores Jacinto Jil Sierra y Andres Seco Remeses. Ed. Espagnola. Eumedia. Espana

2. Book chapters

Basso B. and J.T. Ritchie. 2015. Simulating Crop Growth and Biogeochemical Fluxes in Response to Land Management using the SALUS Model. In S. K. Hamilton, J. E. Doll, and G. P. Robertson, editors. *The ecology of agricultural landscapes: long-term research on the path to sustainability*. Oxford University Press, New York, NY USA.

Basso, B. Nagelkirk R., Sartori L. 2015. Modelling Conservation Agriculture. In: M. Farooq, K. Siddique (eds.), *Conservation Agriculture*, DOI 10.1007/978-3-319-11620-4_8 Springer International Publishing Switzerland 2015

Asseng S., Zhu Y., **Basso B.**, Wilson T., and Cammarano D. 2014. Simulation Modeling: Applications in Cropping Systems. In: Neal Van Alfen, editor-in-chief. *Encyclopedia of Agriculture and Food Systems*, Vol. 5, San Diego: Elsevier; 2014. pp. 102-112. ISBN: 978-0-444-52512-38.

Smucker, A.J.M. and **B. Basso** 2014. Global Potential for a New Subsurface Water Retention Technology Converting Marginal Soil into Sustainable Plant Production. In *The Soil Underfoot: Infinite Possibilities for a Finite Resource* CRC Press Editor(s): G. Jock Churchman, Edward R. Landa.

Basso, B., T.R. McVicar, B. Lee. 2007. Remote sensing and GIS applications in agrometeorology. In K. Stitger. Chapter 12: Guidelines of agrometeorological practices. World Meteorological Organization of the United Nation. Geneva. Switzerland.

Basso, B. 2003. Perspectives of Precision Agriculture. In Garcia Torres L., Benitez J., Martinez Vilela A. (Eds.) *Conservation Agriculture*, Kluwer, pp. 255-262.

Basso, B., L. Sartori, M. Bertocco, G. Olivero. 2003. Evaluation of variable depth tillage: economic aspects and simulation of long term effects on soil organic matter and soil physical properties. In J. Staffor, A. Werner (Eds) *Precision Agriculture*, pp. 62-70.

Basso, F., M. Pisante, **B. Basso**. 2002. Chapter 24: The Agrivalley-sustainable agriculture in dry environment: crop system and management. In N.A. Geeson, C.J. Brandt, J.B. Thornes (Eds.) *Mediterranean Desertification: A Mosaic Of Processes And Responses*. John Wiley & Sons, Ltd. pp.331-346.

Basso, F., M. Pisante, **B. Basso**. 2002. Chapter 25: Soil erosion and land degradation. In N.A. Geeson, C.J. Brandt, J.B. Thornes (Eds.) *Mediterranean Desertification: A Mosaic Of Processes And Responses*. John Wiley & Sons Ltd, pp.347-359.

Basso, B., J.T. Ritchie. 2002. Application of crop models in precision agriculture. In A. Werner, A. Jarfe (Eds.) Precision Agriculture. Pre-Agro, Ktbl, Bmb+F, Bonn, Germany, pp. 181-193.

Bulletins or Monographs N/A

4. Articles (Only ISI WEB OF SCIENCE PEER-REVIEWED)

Liu, B., Asseng, S., C. Müller, F Ewert, J. Elliott, D. Lobell, P. Martre, A. Ruane, D. Wallach, J. W. Jones, C. Rosenzweig, P. Aggarwal, P. Alderman, J. Anothai, **B. Basso**, C. Biernath, D. Cammarano, A. Challinor, D. Deryng, G. De Sanctis, J. Doltra, E. Fereres, C. Folberth, M. Garcia-Vila, S. Gayler, G. Hoogenboom, L. Hunt, R. Izaurralde, M. Jabloun, C. Jones, Kurt Kersebaum, B. Kimball, A.K. Koehler, S Naresh Kumar, C. Nendel, G. O'Leary, J. Olesen, M. Ottman, T. Palosuo, P. Prasad, E. Priesack, T. Pugh, M. Reynolds, E. Rezaei, R.P. Rötter, E. Schmid, M. Semenov, I Shcherbak, E. Stehfest, C. Stöckle, P. Stratonovitch, T. Streck, I Supit, F. Tao, P. Thorburn, K. Waha, G. Wall, E. Wang, J. W. White, J. Wolf, Z. Zhao, and Z. Yan. 2016. Similar estimates of temperature impacts on global wheat yield by three independent methods. In print in Nature Climate Change

Smidt S J., Haacker E M.K., Kendall A.D., Deines J D., Pei L., Cotterman K.A., Li H., Liu X., **Basso, B.**, Hyndman D.W. 2016. Complex water management in modern agriculture: Trends in the water-energy-food nexus over the High Plains Aquifer. **Science of The Total Environment**, 566, 988-1001

Albarenque, SM., **B. Basso**, OP Caviglia, RJM Melchiori. 2016. Spatio-Temporal Nitrogen Fertilizer Response in Maize: Field Study and Modeling Approach. 2016. *Agronomy Journal* Vol. 108, Issue 5 1-13

Jones, JW., JM Antle, **B Basso**, KJ Boote, RT Conant, I Foster, HCJ Godfray, Mario Herrero, Richard E. Howarth, Sander Janssen, Brian A. Keating, Rafael Munoz-Carpena, Cheryl H. Porter, Cynthia Rosenzweig, Tim R. Wheeler. 2016. Brief history of agricultural systems modeling. *Agricultural Systems*
<http://dx.doi.org/10.1016/j.agsy.2016.05.014>

Basso, B., Dumont, B. Cammarano, D., Pezzuolo, A., Marinello, F., Sartori, L. 2016. Environmental and economic benefits of variable rate nitrogen fertilization in a nitrate vulnerable zone. **Science of The Total Environment** Vol. 545-546, 1, Pages 227-235

Basso, B. Fiorentino, C., Cammarano, D., Schulthess U. 2016. Variable rate nitrogen fertilizer response in wheat using remote sensing. *Precision Agriculture*

Volume 17 Issue 2 Pages 168-182

Hamilton, S K; Hussain, M Z; Bhardwaj, A K; Basso, B; Robertson, G P. 2015. Comparative water use by maize, perennial crops, restored prairie, and poplar trees in the US Midwest. *Environmental Research Letters*, Volume 10, Number 6, June 2015, pp. 64015-64022(8)

Basso, B., Liu, L., Ritchie, J.T. 2016. A Comprehensive Review of the CERES-Wheat, -Maize and-Rice Models' Performances. **Advances in Agronomy**. Pages 1-106
<http://dx.doi.org/10.1016/bs.agron.2015.11.004>

Basso, B., Giola P., Dumont, B., Cammarano D., De Antoni Migliorati, M. Pruneddu, G., Giunta, F. 2016 Tradeoffs between maize yield and nitrate leaching in a Mediterranean nitrate-vulnerable zone under current and projected climate scenarios. **PLOS ONE**
DOI: 10.1371/journal.pone.0146360

Basso B., Hyndman, D.W., Kendall A.D., Grace P.R., Robertson, G.P. 2015. Can Impacts of Climate Change and Agricultural Adaptation Strategies Be Accurately Quantified if Crop Models Are Annually Re-Initialized? **PLOS ONE**, Vol 10, 6. DOI: 10.1371/journal.pone.0127333

Maiorano. A., Martre P; Asseng S., Ewert F., Müller C., Rötter R., ; Alexander C Ruane; Semenov M, Wallach D., Wang E., Alderman P., Kassie B., Biernath C., Basso B., Cammarano D., Challinor A.J., Doltra J., Dumont B., Rezaei E.E., Gayler S., Kersebaum K.C., Kimball B.A., Koehler A.K., Liu B., O'Leary G.J., Olesen J.E., Ottman M.J., Priesack E., Reynolds M.P., Stratonovitch; P., Streck T., Thorburn P.J., Waha K., Wall G.W., White J.W., Zhao Z.; Zhu Y. 2016. Crop model improvement reduces multi-model ensemble temperature impact uncertainty. Accepted in **Field Crop Research**.

van Bussel, L., Ewert F, Zhao G, Hoffmann H, Enders A, Wallach D, Asseng S,. Baigorria G,A, Basso B., Biernath C., Cammarano D., Chryssanthacopoulos D., Constantin J, Elliott J, Glotter M., Heinlein F, Kersebaum, K.C., Klein, C, Nendel C, Priesack E., Raynal H, Romero C.C., Rötter R.P., Specka X., and Tao F. 2016. Spatial sampling of weather data for regional crop yield simulations. In press **Agricultural and Forest Meteorology**

Stellacci, AM., Castrignanò A., Troccoli A., Basso B., Buttafuoco G. 2016. Selecting optimal hyperspectral bands to discriminate nitrogen status in durum wheat: a comparison of statistical approaches. *Environmental monitoring and assessment* 188, 3, 1-15

Ruane, A.C., Hudson N I., Asseng, S., Camarrano D., Ewert F., Martre P., Boote, K.J. P.J. Thorburn, P, P.K. Aggarwal, C. Angulo, B. Basso, P., .Bertuzzi, C. Biernath , N. Brisson,

A. J. Challinor, J. Doltra, S. Gayler, R. Goldberg, R.F. Grant, L. Heng, J. Hooker, L. A. Hunt, J. Ingwersen, R. C. Izaurralde, K.C. Kersebaum, C. Stoph, S.N. Kumar, C. Nendel, G. O’leary, J.E. Olesen, T. M. Osborne, T. Palosuo, E. Priesack, D. Ripoche, M.A. Semenov, I. Shcherbak, P. Steduto, C. O. Stockle, Pierre Stratonovitch, T. Streck, I. Supit, F. Tao, M. Travasso, K. Waha, J. W. White, J. Wolf. 2016. Multi-wheat-model ensemble responses to interannual climate variability. *Environmental Modelling & Software* 81, 86-101

De Rosa, D., DW Rowlings, J Biala, C Scheer, B Basso, J Mc Green. 2016
Effect of organic and mineral N fertilizers on N₂O emissions from an intensive vegetable rotation. *Biology and Fertility of Soils*, 1-14

Asseng, S., F. Ewert, P. Martre, R.P. Rötter, D.B. Lobell, D. Cammarano, B.A. Kimball, M.J. Ottman, G.W. Wall, J.W. White, M.P. Reynolds, P.D. Alderman, P.V.V. Prasad, P.K. Aggarwal, J. Anothai, **B. Basso**, C. Biernath, A.J. Challinor; G. De Sanctis J, Doltra, E. Fereres, M. Garcia-Vila, S. Gayler, G. Hoogenboom, L.A. Hunt, R.C. Izaurralde, , M. Jabloun, C.D. Jones, K.C. Kersebaum, A.-K. Koehler, C. Müller, S., Naresh Kumar, C. Nendel, G. O’Leary, J.E. Olesen, T. Palosuo, E. Priesack, E. Eyshi, Rezaei, A.C. Ruane, M.A. Semenov, I. Shcherbak, C. Stöckle, P. Stratonovitch, T., Streck, I. Supit, F. Tao, P. Thorburn, K. Waha, E. Wang, D. Wallach, J. Wolf, Z. Zhao and Y. Zhu 2015. Rising temperatures reduce global wheat production. 2015. **Nature Climate Change**
Doi:10.1038/nclimate2470

Makowski D., Asseng, S., F. Ewert, P. Martre, R.P. Rötter, D.B. Lobell, D. Cammarano, B.A. Kimball, M.J. Ottman, G.W. Wall, J.W. White, M.P. Reynolds, P.D. Alderman, P.V.V. Prasad, P.K. Aggarwal, J. Anothai, **B. Basso**, C. Biernath, A.J. Challinor; G. De Sanctis J, Doltra, E. Fereres, M. Garcia-Vila, S. Gayler, G. Hoogenboom, L.A. Hunt, R.C. Izaurralde, , M. Jabloun, C.D. Jones, K.C. Kersebaum, A.-K. Koehler, C. Müller, S., Naresh Kumar, C. Nendel, G. O’Leary, J.E. Olesen, T. Palosuo, E. Priesack, E. Eyshi, Rezaei, A.C. Ruane, M.A. Semenov, I. Shcherbak, C. Stöckle, P. Stratonovitch, T., Streck, I. Supit, F. Tao, P. Thorburn, K. Waha, E. Wang, D. Wallach, J. Wolf, Z. Zhao and Y. Zhu 2015. Rising temperatures reduce global wheat production. 2015. A statistical analysis of three ensembles of crop model responses to temperature and CO₂ concentration.
Agricultural and Forest Meteorology Vol 214, 483-493

Dzotsi, K. A.,; **Basso, B.**; Jones, J. W. 2015. Parameter and uncertainty estimation for maize, peanut and cotton using the SALUS crop model. **Agricultural Systems** 135 (2015) 31-47

Dumont, B., **Basso, B.** Leemas, B. Bodson, J.P. Destain, M.F. Destain. 2015 Systematic analysis of site-specific yield distributions resulting from nitrogen management and climatic variability interactions. **Precision Agriculture** Vol 16, Issue 4, 361-384

O’Leary, G.J., Christy, B., Nuttall, J., Huth, J., Cammarano, D., Stöckle, C., **Basso, B.**, Shcherbak, Fitzgerald, G., Luo, Q., Farre-Codina, I., Palta, J., Asseng, S., 2015.

Response of wheat growth, grain yield and water use to elevated CO₂ under a Free Air CO₂ Enrichment (FACE) experiment and modelling in a semi-arid environment. **Global Change Biology**. doi: 10.1111/gcb.12830.

Stuart D., **Basso, B.** S. Marquat-Pyatt, Robertson, G.P., Zhao J. 2015. Coupled Human-Natural Systems Understanding of Agricultural Nitrogen Loss. **Bioscience** 65,6, 571-578

Dumont, B., **Basso, B.** Leemas, B.Bodson, J.P. Destain, M.F. Destain. 2015. A comparison of within season yield prediction algorithms based on crop model behaviour analysis. **Agricultural and Forestry Meteorology**. Vol 204, 10-21

Dumont, B., **Basso, B.** Leemas, B.Bodson, J.P. Destain, M.F. Destain. 2015. Climatic risk assessment to improve nitrogen fertilisation recommendations : A strategic crop model-based approach. **European Journal of Agronomy** Vol 65, 10-17.

Klavidko E.J., M.J. Helmers, L.J. Abendroth, D. Herzmann, R. Lal, M.J. Castellano, D.S. Mueller, J.E. Sawyer, R.P. Anex, R.W. Arritt, **B. Basso**, J.V. Bonta, L.C. Bowling, R.M. Cruse, N.R. Fausey, J.R. Frankenberger, P.W. Gassman, A.J. Gassmann, C.L. Kling, A. Kravchenko, J.G. Lauer, F.E. Miguez, E.D. Nafziger, N. Nkongolo, M. O'Neal, L.B. Owens, P.R. Owens, P. Scharf, M.J. Shipitalo, J.S. Strock and M.B. Villamil 2014. Standardized research protocols enable transdisciplinary research of climate variation impacts in corn production systems. **Journal of Soil And Water Conservation** Volume: 69 Issue: 6 Pages: 532-542 DOI: 10.2489/jswc.69.6.532

Basso B. and J. T. Ritchie. 2014. Temperature and drought effects on maize yield. **Nature Climate Change** 4, 233 (2014) doi:10.1038/nclimate2139

Martre, P., Wallach, D., S. Asseng, F. Ewert, J.W. Jones, , R.P. Rotter, K.J. Boote, A.C. Ruane, P.J., Thorburn, D., Cammarano; J.L., Hatfield, , C. Rosenzweig, P.K. Aggarwal, C. Angulo, **B. Basso**, P., .Bertuzzi, C. Biernath , N. Brisson, A. J. Challinor, J. Doltra, S.Gayler, R.Goldberg, R.F. Grant, L. Heng, J. Hooker, L. A. Hunt, J. Ingwersen, R. C. Izaurrealde, K.C. Kersebaum, C. Stoph, S.N. Kumar, C. Nendel, G. O'leary, J.E. Olesen, T. M. Osborne, T. Palosuo, E. Priesack, D. Ripoche, M.A. Semenov, I. Shcherbak, P. Steduto, C. O. Stockle, Pierre Stratonovitch, T. Streck, I. Supit, F. Tao, M. Travasso, K. Waha, J. W. White, J.Wolf 2014. Multimodel ensembles of wheat growth: Many models are better than one. **Global Change Biology**, doi: 10.1111/gcb.12768

Bassu, S. N. Brisson, J. L. Durand, K. Boote, J. Lizaso, J.W. Jones, C. Rosenzweig, A. Ruane, M. Adam, C. Baron, **B. Basso**, C. Biernath, H. Boogaard, S. Conijn, M. Corbeels, D. Deryng, G.de Sanctis, S. Gayler, P. Grassini, J. Hatfield, S. Hoek, C. Izaurrealde, R. Jongschaap, A. Kemanian, C. Kersebaum, S.H. Kim, N. Kumar, D. Makowski, C. Muller, C. Nendel, E.Priesack, M. Virginia Pravia, F.Sau, I. hcherbak, F.Tao, E.Teixeira, D. Timlin, and K.Waha 2014. How do various maize crop models vary in their responses to climate

change factors? **Global Change Biology** Volume: 20 Issue: 7 Pages: 2301-2320 DOI: 10.1111/gcb.12520 DOI: 10.1111/gcb.12520

Dumont, B., **Basso B.**, V. Leemas, B. Bodson, J.P. Destain, M.F. Destain. 2014. Systematic analysis of site-specific yield distributions resulting from nitrogen management and climatic variability interactions. **Precision Agriculture**. DOI 10.1007/s11119-014-9380-7

Cammarano D., G. Fitzgerald, R. Casa, **B. Basso**. 2014. Assessing the robustness of vegetation indices to estimate wheat N in Mediterranean environments. **Remote Sensing**. 2014, 6, 2827-2844; doi:10.3390/rs6042827

*Van Hoang, TY Chou, **B. Basso**, ML Yeh, CY Chien. 2014. Climate Change Impact on Agricultural Productivity and Environment Influence based on Simulation Model. **International Journal of Advanced Remote Sensing and GIS** 3 (1), pp. 642-659

Marino, S., M. Aria., **B. Basso**, A. Leone., A. Alvino. 2014. Use of soil and vegetation spectroradiometry to investigate water use efficiency of a drip irrigated tomato. 2014. **European Journal of Agronomy** 59, 66-77.

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Stornaiuolo, S., **B. Basso**. 1998. Impiego del misuratore di clorofilla per migliore gestione dei fertilizzanti azotati. *Agricoltura e Ricerca* 178: 101-108.

Basso, B., S. Stornaiuolo. 1999. Agricoltura di precisione: aspetti conoscitivi e possibilità di attuazione. *Agricoltura e Ricerca* 179(1): 7-20.

Basso, F., M. Pisante, A.S. De Franchi, **B. Basso**. 1997. La difesa dai fenomeni erosivi nell'Italia meridionale. *Informatore Agrario* 43: 33-

INVITED LECTURES AND KEYNOTES

- 2015 EXPO 2015 – Universal Exposition
Keynote Title: Crop Yield Prediction with Remote Sensing and Simulation Modeling. Milan, Italy, Oct 9
- 2015 American Association of Agricultural Engineering; Climate Change Symposium: Adaptation and Mitigation. Title: The crucial role of soil when modeling the impact of climate change on crop production. Chicago, May 3-5
- 2014 American Geophysical Union
Title: Modeling soil processes for adapting agricultural systems to climate. variability and change. San Francisco, CA, Dec. 16
- 2014 American Society of Agronomy
Title: Coupling laser scanner data with multispectral and thermal imagery from a UAV in wheat and corn fields in upper Midwest. Long Beach, CA, Nov. 3
- 2014 United Nation Sustainable Development Solution Network (UN-SDSN).
Title: Big Data for Smallholder Farmers: What can we learn from large scale agriculture? Rockefeller Foundation Bellagio Center. Bellagio, Italy, Sept.16
- 2014 National Institute Agricultural Technologies (INTA) Argentina
Title: Assessing and modeling climate variability impact on agriculture. Manfredi, Cordoba, Argentina, Sept. 23
- 2014 National Institute Agricultural Technologies (INTA), Argentina
Title: Advances of UAVs application for managing Nitrogen fertilizers in corn. Manfredi, Cordoba, Argentina, Sept. 24
- 2014 State University of San Paolo (UNESP), Brazil
Title: Lesson learned from twenty years of crop modeling. Jaboticabal, San Paolo State, Brazil, May 20
- 2013 Peking University, China
Title: Water sustainability in agricultural land within megacities. Beijing, China, Jan. 10
- 2012 Asian Federation Information Technologies, Taiwan
Keynote Title: Quantifying the odds in decision making in agriculture. Taipei, Taiwan, Sept. 3
- 2011 Chinese Academy of Agricultural Sciences, Remote Sensing Institute
Title: Linking Tomography with Remote Sensing and Crops Models to Interpret Causes of Yield Variability, Beijing, China, Sept 11
- 2010 International Society Horticultural Sciences, (ISHS)

- Keynote Title: Exploring options for enhancing agro-ecosystems services over space and time. Lisbon, Portugal, Aug. 24
- 2009 National Institute of Energy and Sustainable Development - “World day on Food”
Keynote Title: Agronomy: a need for food, energy and environment.
Rome, Italy, Dec. 11
- 2008 International Forum of Sustainable Development, Soil and Water Conservation Service of Taiwan.
Keynote Title: “Exploring options for enhancing agro-ecosystems services and sustainable development” Taipei, Taiwan, May 22-25
- 2007 Queensland University of Technology
Title: “ Environmental Systems and Modeling”
Brisbane, QLD, May, 20
- 2006 International Congress on “Spatial data methods for environmental and ecological processes” Organized by International Society Of Statistics
Keynote Title: Evaluation of techniques for assessing spatial and temporal variability of crop yield at field scale. Baia delle Zagare, Italy, Sept. 13-15
- 2005 Italian Association Scientific Societies in Agricultural Sciences.
University of Modena and Reggio Emilia
Title: Water Use Efficiency in Changing Planet. Reggio Emilia, Italy Dec. 6-7
- 2004 Feng Chia University, 10 decade celebration of the International GIS Centre.
Keynote Title: Combining GIS and crop modeling for precision agriculture
Taichung, Taiwan, Jul. 10
- 2002 Precision Agriculture Conference, German Ministry of Research and Development
Keynote Title: Application of crop-growth models in Precision Agriculture. Bonn, Germany, Mar. 14
- 2001 I World Congress on Conservation Agriculture, Organized by UN-FAO, ECAF
Keynote Title: Perspectives of Precision Agriculture in Conservation Agriculture.
Madrid, Spain, Oct. 3
- 2000 CIMMYT, Mexico
Title: Natural Resource Management for land use sustainability.
Mexico City, Nov. 22
- 2000 Nowlin Chair Symposium to honor Prof. Joe T. Ritchie, Michigan
Title: Role of modeling in Precision Agriculture. Detroit, MI, Nov. 10
- 2000 International Crop Research Institute for Semi Arid Tropics, ICRISAT, India
Title: Spatial validation of crop models. Hyderabad, Andhra Pradesh, Oct. 25
- 2000 American Society of Agriculture Engineering (ASAE)
Title: Terrain Analysis and Simulation Modeling for watershed management
Milwaukee, WI, Jul. 10
- 1998 International Crop Research Institute for Semi Arid Tropics, ICRISAT, India
Title: “Digital terrain modelling to simulate spatial variability of soil water balance” Hyderabad, Andhra Pradesh, India, Aug. 5
- 1998 Centre for Research in Dryland Agriculture (CRIDA), India

- Title: Using Crop Models, Remote Sensing and Digital Terrain Models to Interpret Causes of Yield Variability. Hyderabad, India, Aug. 3
- 1998 Indian Institute for Medium Range Weather Forecast, Indian Department of Meteorology Title: Integrating Crop Models, Remote Sensing and Digital Terrain Models to Interpret Causes of Yield Variability. New Delhi, India Jul. 23
- 1998 Indian Council of Agricultural Research, India
Title: Interpreting Yield Variability Using Crop Models, Remote Sensing and Digital Terrain Models. New Delhi, India, Jul 22
- 1998 Feng Chia University, Taiwan
Using Crop Models, Remote Sensing and Digital Terrain Models to Interpret Causes of Yield Variability, Taiching, Taiwan, Jun 29
- 1998 Chinese Academy of Agricultural Sciences, China
Title: Using Crop Models, Remote Sensing and Digital Terrain Models to Interpret Causes of Yield Variability, Nanjing, China, Jun. 22
- 1998 Monsanto, Italy
Title: Interpreting Yield Variability Using Crop Models, Remote Sensing and Digital Terrain Models. Milan, Italy, Feb. 5

PROFESSIONAL ACTIVITIES

Michigan State University

- 2012 – present Leader of AgMIP Soil and Crop Rotation Modeling Intercomparison. Initiative within the Global Project AgMIP: Agricultural Modeling Intercomparison and Improvement
- 2001- present Co-developer of System Approach for Land Use Sustainability (SALUS) model in collaboration with Emeritus Distinguished Professor Joe T. Ritchie
- 2014 Invited participant to the *Bill and Melinda Gates* Foundation initiative: “Next-Gen Models”. Co-author of two white papers as a result of the meeting held in Portland, Oregon, Apr. 21-24.
- 2014 Invited participant to the *Bill and Melinda Gates* Foundation “Next-Gen Models Conference”. held at GATES Foundation headquarters in Seattle, WA, Aug. 13
- 2014 Consultant for Scientific and Advisory Committee of Food and Agriculture Organization of the United Nations (UN-FAO) program on Global Strategy to improve agricultural statistics Jul. 2013-Jan. 2014
- 2013 Chair of the NP 216, Panel 3 –Modeling and Decision Systems - Office of Scientific Quality Review of the USDA-ARS, Washington DC
- 2013 Co-convener of AGU session on Climate change impact on Agriculture, AGU annual meeting, San Francisco, Dec. 8
- 2014 Invited participant to the USDA NIFA-AgMIP workshop on data

- 2013 harmonization, Gainesville, Florida, Jan. 24
Invited participant to DOE Workshop on Research for Sustainable Bioenergy Office of Biological and Environmental Research Washington D.C., Oct. 2-3

University of Basilicata

2008- 2011 Faculty Member of International Doctorate School

- 2010 Co-convener of European Geoscience Association session on Soil Erosion and modeling, Apr 3, Vienna, Austria
- 2007 Erasmus project fellowship for faculty at the Ist. Politecnico de Porto Allegre, Portugal, May 1-15
- 2005 Panelist of the WUEMED Workshop. National Research Council Rome. Sep. 30
- 2003 Expert meeting. Crop water productivity program. FAO Headquarters Rome Feb. 26-28
- 2003 Expert meeting on modeling tillage and residues management. CIMMYT, Mexico City Dec. 2-7
- 1999- 2001 Invited seminars for the Graduate School Special Seminar Series: University of Bologna, Padova, Palermo, Potenza, Rome La Sapienza, Tuscia, Napoli, Catania, Foggia, Campobasso, Teramo

OUTREACH

- 2015 Invited speaker at the “Great Lakes Crop Summit”. Conference organized by Corn, Wheat and Soybean board of Michigan
- 2015 Jan 6 River to River NPR Iowa Public Radio phone interview oil pipeline crossing Iowa: Impact on agricultural soil and the environment in the event of an oil spill on soils
- 2014 Feb 27 Keynote Speaker at the Annual dinner and conference Mason Lake Conservation District. Title: UAV in agriculture; Ludington, MI,
- 2014 Mar 5 Keynote Invited speaker at workshop “ Growing Michigan agriculture” organized by Michigan Farm Bureau, MSU Extension Kellogg Center, East Lansing,

- 2014 Oct. 7, WKAR Current State: Drone technology: a game changer in agriculture
- 2014 Sept. 9, Special on Basso's research broadcasted nationally on TV on PBS Newshour: <http://www.pbs.org/newshour/bb/drones-limit-fertilizer-flow-lake-erie/>
- 2014 Jul. 31, Special on Basso's research - Great Lakes Now Connect: Food Supply <http://www.greatlakesnow.org/2014/07/food-supply/>
- 2014 Research featured in Michigan University Research Corridor partners on how to protect Michigan's precious water resources and enhance its "blue economy" through hundreds millions of dollars in research and service.
- 2013 December 2013 issue Front cover page with photo on the CSA news for editorial article on: Unmanned Aerial Systems for Field Scouting and Spraying doi:10.2134/csa2013-58-12-1 CSA News Magazine 58:4-9
- 2013 Sept. 19. FM 88.9 Radio Impact, for research on using drones to improve N fertilizer management
- 2013 Sept. 12, 2013. Interviewed on National Public Radio (NPR); The Greening of the Great Lakes WJIM AM
- 2013 Sept. 11, 2013. Front cover page on the Lansing State Journal for research on using drones to improve N fertilizer management
- 2013 Sept. 11, 2013 Interviewed on Fox47/Channel 6 TV evening news
- 2013 Sept. 10, 2013. Video broadcasted by NSF Science Now on Basso's research on drone and crop modeling application in agriculture
- 2013 Invited speaker at Family Farm Group National Conference Indianapolis, Jul.14

TECHNOLOGY TRANSFER OUTREACH

- 2014 GeoYields Start-up Company as result of US Patent No. 62/087,924. Flagship Venture Lab Investors, Cambridge MA, USA

SERVICE AT MICHIGAN STATE UNIVERSITY

2014 Selected as speaker for the Empower Extraordinary Capital Campaign of Michigan State University, Wharton Center, MSU, Oct. 24, https://www.youtube.com/watch?v=S_Rd6yYjpCM

2014 Keynote speaker at the Climate Change Symposium, Kellogg Center Auditorium, MSU, East Lansing, Apr. 2,

2014-2016 Member, MSU Global Water Initiative committee for Water Network Research Enhancements –

2014 Member of the MSU Global Water Initiative Survey Committee for New Curricula in Water Sciences

2013 Chair, Search committee for open rank Hydrogeology position in the Department of Geological Science -

2013 Member of search Committee of the open rank Geomicrobiology position in the Department of Geological Science -

2013 Member of the organizing committee of the United Nations 68th Anniversary Commemoration Conference: Water, Food Security And The Developing Global Crisis, October 27-29, , East Lansing, Michigan

2014 Member of the Department Graduate Student Committee

EDITORIAL AND SCIENTIFIC REFEREES ACTIVITIES

Currently serving on the Editorial Board of:

2008 - present European Journal of Agronomy

2008 – present Agricultural Systems

2010 – present Italian Journal of Agronomy

2008-2012 Agronomy Journal

Referee Activities

Nature Climate Change, Agronomy Journal, Agricultural Systems, Agriculture Ecosystem and Environment Catena, Computer and Electronics in Agriculture, Crop Science, Environmental Research Letters, European Journal of Agronomy Ecological Modeling, Environmental and Engineering Sciences IEEE, Environmental Modeling and Software, Field Crop Research, Geoderma, International Journal of Geographic Information Systems, Journal of Environmental Management, Journal of Environmental Quality, Plant and Soil, PLOS One; Precision Agriculture, Remote Sensing, Soil and Tillage Research, Soil Science Society of America Journal, Transaction of the ASAE Transactions on Geoscience and Remote Sensing

External Evaluator for PhD. Dissertations for the University of Melbourne and the University of Adelaide

TEACHING

a. Courses taught at Michigan State University

2016 Fall Semester: Water and Food. GLG 446 3 cr.

2015 Summer Semester: GLG 893 Biological Modeling (2 cr., 7 students)

2015 Spring semester: ISP 203 Global Change (3 cr., 227 students)

2014 Fall semester: Agricultural Ecology (co-taught with G.P. Robertson) (2 cr., 27 students)

2014 Spring Semester: ISP 203 Global Change (3 cr., 194 students)

2013 Summer Semester: GLG 893 Biological Modeling (2 cr., 6 students)

2012 Fall Semester: Hydrogeology (co-taught with Warren Wood) (3 cr., 38 students)

b. Courses taught 2001-2012 at the University of Basilicata, Italy

Crop Science, (3 cr., 25 students)

Scientific Communications and Methodology, (1 cr, 10 students)

Modeling Soil-Plant Atmosphere Systems, (1 cr., 10 students)

Agro-Ecology, (3 cr, 30 students)

Soil and Crop Management (3 cr, 30 students)

c. International courses

2007, 2010. “Soil Physics” Queensland University of Technology, Brisbane, Australia (1 week, 50 students)

2003. European Conference on Precision Agriculture Short course on Crop Models and Precision Agriculture for conference participants.

d. Advising

Michigan State University

PhD Students (principal advisor):
Ryan Nagelkirk (2013-present)

M.S. Students (principal advisor):
Lin Liu (2012-2015)

Post-Doctoral scholars (current positions)

2013-2014 Liang Tang (Currently Assistant Professor at Nanjing Agricultural University)

University of Basilicata

Students supervised (with date of graduation)

Ph. D.

2012 Costanza Fiorentino (Post-doc at the University of Basilicata)

2012 Armando D’Errico (High School math and physics teacher)

2010 Giovanni Cafiero (Cereal Commodities Company Employee)

2005 Raimondo Faraone Mennella (Wine maker and vineyard consultant)

Masters

2012 Daniele De Rosa (PhD candidate Queensland University of Technology)

2011 Alessandro Fontana (Conservation tillage farmer association)

2008 Ciro Di Matteo (Wine maker)

2007 Pietro Astorino (Producer)

2007 Ernesto Luciano (Sale agent)

2005 Gianfranco Bitella (Geophysical and Environmental monitoring scientist)

2004 Cosimo Antonazzo (Crop Consultant)

2003 Davide Cammarano (Scientist at James Hutton Institute, Scotland)

Co supervisor for the following PhD students

2008 Matteo Rota (University of Padova) (Crop Consultant)

2005 Matteo Bertocco (University of Padova) (Crop Consultant)

2004 Pasquale De Vita (University of Basilicata) (Senior Scientist at the Italian Research Council for Agricultural Research, and Co-director of the Cereal Research Institute)

2004 Simona Bassu (University of Sassari) (Scientist at INRA, France)

2004 Anna Caianello (University of Basilicata) (High School Science teacher)

2004 Roberto Finizio (University of Basilicata) (High School Science teacher)