

Bruno Basso – Short CV

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Summary

Bruno Basso's research deals mainly with water, carbon, nitrogen cycling and modeling in agro-ecosystems, spatial analysis of crop yield, and climate change impact in agriculture. Basso's modeling research has focused on extending soil-crop-atmosphere models to spatial domains at the field scale, and in particular on developing, testing, and deploying SALUS, a next-generation process-based model that integrates crop productivity with water, carbon, and nutrient fluxes in a spatially explicit manner. Through this research, it has been possible to integrate the effects of topography and soil properties on soil water balance and thereby partition surface vs. subsurface flows in different landscape positions. This has important value for better understanding and predicting nitrogen conservation patterns in cropped landscapes as well as soil carbon change - and has led to important insights for the likely effects of climate change on carbon and water footprints of future cropping systems, as noted in recent publications. Dr. Basso has developed a procedure to initialize soil carbon models by identifying organic carbon pool sizes based on previous land use and management strategies. During his career, Dr. Basso has participated as PI and Co-PI in several projects. He is the author of more than 150 publications (Books written (2); chapters of books (6); technical refereed papers (47); Technical papers non refereed (98); invited lectures (24).

Professional Preparation

PhD. 2000 Michigan State University, - Crop and Soil Sciences
Laurea 1992 University of Naples Federico II, Italy - Agricultural Sciences

Appointments

2012- present	Associate Professor, Dept. Geological Sciences and W.K. Kellogg Biological Station, Michigan State University, USA
2005 - 2012	Associate Professor, Dept. Crop Systems, Forestry and Environ. Sciences, University of Basilicata, Italy
2000 - 2005	Assistant Professor, Dept. Crop Systems, Forestry and Environ. Sciences, University of Basilicata, Italy
2008 - present	Adjunct Professor, Queensland University of Technology, Ist. Future Environment , Brisbane, Australia
1997	Visiting Research associate CIMMYT – Mexico DF. Mexico,
1998	Visiting Research associate -ICRISAT – Andhra Pradesh., India
1993	Research assistant - CRC, CISRO- Waite Inst. Adelaide - Australia

Honors and Awards

2010 Intern. Soc. of Precision Agriculture. "Pierre Robert" Precision Agriculture Award"
2008 Soil Science Society of America "L.Frederick Lloyd Soil Teaching Award"
2007 Soil Science Society of America "L.R. Ahuja Agricultural System Modeling Award"
1997 "Australian Overseas Outstanding Student Award" from the University of Adelaide, Australia (1997).

Research Highlight on CSA news for the paper Senthilkumar, S., **B. Basso**, A. N. Kravchenko, G. P. Robertson. 2009. Contemporary Evidence of Soil Carbon Loss in the U.S. Corn Belt. *Soil Sci. Soc. Amer. Jour.* 73: 6 2078-2086

Research Highlight European Journal of Agronomy" (August 2011) **Basso B.**, Sartori L., Bertocco M., Cammarano D., Grace P.R. 2011. Economic and environmental evaluation of site-specific tillage in a maize crop. *Eur. J Agron.* 35, 83-92

September 2012. Invited Keynote speaker at the Annual Meeting of the Italian Society of Agronomy, Bari, Italy 20-21 September, 2012

September 2012. Invited Keynote speaker the Asian Federation on Information Technology in Agriculture (AFITA)-Taipei- Taiwan

June 2011. Invited speaker at Altai State University, Siberia Russia. Keynote Seminar on "Global food sustainability and climate change"

May 2011. Invited speaker at INTA Manfredi Cordoba by Ecophysiology and Precision Agriculture Group"- Keynote Seminar at national level on Modelling spatial variability of crop yield.

March 2010. Invited keynote speaker at the International Society Horticultural Sciences, (ISHS) with a lecture title: "Exploring options for enhancing agro-ecosystems services over space and time", Lisbon

December 2008. Invited reviewer of the Science and Technology Advisory Group, Premier of Taiwan Government

December 2009. Keynote invited from the Italian National Institute of Energy and Sustainable development as keynote speaker at the "World day on Food" December 11, 2009 with a lecture titled: "Agronomy: A need for food, energy and environment." The event was televised and covered by national newspapers.

September 2006. Invited keynote speaker at the International Conference on "Spatial data methods for environmental and ecological processes"- International Society of Statistics, Baia delle Zagare, Italy Topic: "Evaluation of techniques for assessing spatial and temporal variability of crop yield at field scale"

February 2003. Invited participant to the Expert Panel on Crop Water Productivity Program of the United Nation (FAO).

February 2001. Invited keynote speaker I World Congress on Conservation Agriculture, Madrid (invited by FAO, ECAF) Topic of presentation: "*Perspectives of Precision Agriculture in Conservation Agriculture*".

1995. National Research Council Italy Scholarship for Overseas Internship

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), European Society of Agronomy (ESA), Italian Society of Agronomy (SIA).

Publications

Publications on International ISI Journals

Asseng, S. F. Ewert, C. Rosenzweig, J.W. Jones, J.L. Hatfield, A. Ruane, K.J. Boote, P. Thorburn, R.P. Rötter, D. Cammarano, N. Brisson, **B. Basso**, P. Martre, P.K. Aggarwal, C. Angulo, P. Bertuzzi, C. Biernath, A.J. Challinor, J. Doltra, S. Gayler, R. Goldberg, R. Grant, L. Heng, J. Hooker, L.A. Hunt, J. Ingwersen, R.C. Izaurralde, K.C. Kersebaum, C. Müller, S. Naresh 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. Stöckle, P. Stratonovitch, T. Streck, I. Supit, F. Tao, M. Travasso, K. Waha, D. Wallach, J.W. White, J.R. Williams and J. Wolf. 2013
Quantifying uncertainties in simulating wheat yields under climate change
In print on *NATURE Climate Change*

Cammarano, D., Stefanova L., Ortiz, B.V., Ramirez-Rodrigues, M., Asseng, S. Misra, V., Wilkerson, G., **Basso, B.**, Jones J.W., Kenneth J. Boote, DiNapoli, S. 2013. Evaluating the fidelity of downscaled climate data on simulated wheat and maize production in the southeastern US. In print on *Regional Environmental Change*

Cammarano, D., Payero, J., **Basso, B.**, Stefanova, L., Grace, P., 2012. Adapting wheat sowing dates to projected climate change in the Australian sub-tropics: analysis of crop water use and yield. *Crop and Pasture Science*. 63, 974-986.

C. Rosenzweig, J.W. Jones, J.L. Hatfield, A.C. Ruane, K.J. Boote, P. Thorburn, J.M. Antle, G.C. Nelson, C. Porter, S. Janssen, S. Asseng, **B. Basso**, F. Ewert, D. Wallach, G. Baigorria, and J.M. Winter. 2012. The Agricultural Model Intercomparison and Improvement Project (AgMIP): Protocols and Pilot Studies. *Agricultural and Forestry Meteorology* doi:10.1016/j.agrformet.2012.09.011.

Basso, B., Sartori, L., Cammarano D., Grace P., Sorensen C., Fountas S. 2012. Environmental and economic evaluation of N fertilizer rates in a maize crop in Italy: a spatial and temporal analysis using crop models. *Biosystems Engineering*, 113, 2, 103-111
DOI: 10.1016/j.biosystemseng.2012.06.012

Basso B. and J.T. Ritchie. 2012. Assessing the impact of management strategies on water use efficiency using soil-plant-atmosphere models. *Vadose Zone Journal* Volume: 11 Issue: 3 DOI: 10.2136/vzj2011.0173 Published: AUG 2012

Diacono, M, Castrignanò, M., Troccoli, A. De Benedetto, D., **Basso, B.**, Rubino, P. 2012. Spatial and temporal variability of wheat grain yield and quality in a Mediterranean environment: A multivariate geostatistical approach. *Field Crops Research* 131 (2012) 49–62

Colecchia, S. Basso B., Cammarano, D., Gallo, A. Mastrangelo A., Pontieri P.b., Del Giudice, Pignone D, De Vita, P. 2012. On the relationship between N management and grain protein content in six durum wheat cultivars in Mediterranean environment. *Journal of Plant Interactions* DOI:10.1080/17429145.2012.710656

Basso, B., Fiorentino, C., Cammarano, D., Cafiero, G., Dardanelli, J. 2012. Analysis of rainfall distribution on spatial and temporal patterns of wheat yield in Mediterranean environment. *European Journal of Agronomy* 41 (2012) 52– 65

Basso, B., De Simone, L., Cammarano, D., Martin, E.C., Margiotta, S., Grace, P.R., Yeh, M.L., Chou, T.Y. 2012. Evaluating Responses to Land Degradation Mitigation Measures in Southern Italy. *International Journal of Environmental Research*, Vol. : 6 issue 2 pages: 367-380

Syswerda, S.; **Basso, B.**; Hamilton, S.K.; Tausig, J.B.; Robertson G.P. 2012. Long-term Nitrate Loss along an Agricultural Intensity Gradient in the Upper Midwest USA. *Agriculture, Ecosystems and Environment*, 149, 10-19

Basso, B.; Ritchie, J.T.; Jones, J.W. 2012. On modeling approaches for effective assessment of hydrology of bioenergy crops: comments on Le et al., (2011) Proc Natl Acad Sci USA 108:15085-15090. *European Journal of Agronomy* 38: 64-65

Giola, P.; **Basso, B.**; Pruneddu, G.; Giunta F.; Jones, J.W. 2012. Impact of manure and slurry applications on soil nitrate in a maize-triticale rotation: field study and long term simulation analysis. *European Journal of Agronomy* 38, 43–53

Grace, P., Antle J., Aggarwal P., Ogle, S., Paustian, K., **Basso, B.** 2012 Soil carbon sequestration and associated economic costs for farming systems of the Indo-Gangetic Plain: a meta-analysis. *Agriculture Ecosystem and Environment* 146, 1 137-146

Grace P.R., **Basso B.** 2012. Offsetting greenhouse gas emissions through biological carbon sequestration in North Eastern Australia. *Agricultural Systems* 105, 1, 1-6

Todaro L.; Zuccaro L.; Marra M., Scopa A., Basso B. 2012. Steaming effects on selected wood properties of Turkey oak by spectral analysis. *Wood Science and Technology* Vol. 46 1-3 Pages: 89-100

Finley, A., Banerjee S., Basso B. 2011. Improving Crop Model Inference Through Bayesian Melding with Spatially-Varying Parameters. *Journal of Agricultural, Biological and Environmental Statistics*: 16 : 4 453-474

Fiorentino, C., Tarantino C., Pasquariello G., **Basso B.** 2011. Improved method for discriminating agricultural crops using geostatistics and remote sensing. 2011. *Journal. Applied Remote Sensing* Vol. 5 1-18

Cammarano D., Fitzgerald, G., **Basso, B.** O'leary, G. Grace, P.R., Fiorentino C. 2011. Use of the Canopy Chlorophyll Content Index (CCCI) For Remote Estimation Of Wheat Nitrogen Content In Rainfed Environments. *Agronomy Journal* 103: 6 - 1597-1603

Martin E. C.; Sriboonlue S.; **Basso B.** 2011. Dairy manure impact on soil phosphorous, nitrogen, and salt accumulation in an oat-maize rotation in southwestern united states. *Applied Engineering in Agriculture*, Vol. 27 Issue: 1 Pages: 87-95

Cammarano Davide; Fitzgerald Glenn; Basso B. Grace P.R. 2011. Remote estimation of chlorophyll on two wheat cultivars in two rainfed environments, *Crop & Pasture Science* Vol 62 4 269-275

Basso B., Ritchie, J.T., Cammarano, D., Sartori L. 2011. A strategic and tactical management approach to select optimal N fertilizer rates for wheat in a spatially variable field. *European Journal of Agronomy* 35 (2011) 215– 222

Basso, B. Gargiulo, O., Paustian, K., Porter C.H., Robertson, G.P., Grace P.R., Jones J.W. 2011. Procedures for initializing soil organic carbon pools in DSSAT-Century model for agricultural systems. *Soil Science. Society. America. Journal*; 75-1-69-78

Basso B., Sartori L., Bertocco M., Cammarano D., Grace P.R. 2011. Economic and environmental evaluation of site-specific tillage in a maize crop in NE Italy. *European Journal of Agronomy* 35, 83–92

Grace P.R., Robertson G.P., Millar N., Colunga-Garcia M., **Basso B.**, Gage S. 2011. The Contribution of Maize Cropping in the Midwest USA to Global Warming: A Regional Estimate. 2010. *Agricultural Systems* Volume 104, Issue 3, March 2011, Pages 292-296

Grace P.R., Antle J. Ogle S, Paustian K, **Basso B.** 2010. Soil carbon sequestration rates and associated economic costs for farming systems of South-Eastern Australia. *Australian Journal of Soil Research* (48) 8 10-16

Basso B., Cammarano D., Troccoli A., Chen D., Ritchie J.T.. 2010. Long-term wheat response to nitrogen in a rainfed Mediterranean environment: Field data and simulation analysis. *European Journal of Agronomy* 33 (2010) 132–138

Sørensen, C.G., Fountas, S., Nash, E., Pesonen, L., Bochtis, D., Pedersen, S.M. **Basso B.** Blackmore S.B. 2010. Conceptual model of a future farm management information system. *Computers, Electronic In Agriculture*. 72, 1. 37-47

Basso, B., Amato, M., Kravchenko, A.N., Rossi, R., Sartori, L., Bitella, G. 2010. 2-D Spatial and Temporal Variation of Soil Physical Properties In tillage Systems using Electrical Resistivity Tomography. *Agronomy Journal*. 102, 2 441-442

Senthilkumar, S., **B. Basso**, A. N. Kravchenko, G. P. Robertson. 2009. Contemporary Evidence of Soil Carbon Loss in the U.S. Corn Belt. *Soil Science. Society. America. Journal*. 73: 6 - 2078-2086

Basso B., Cammarano D. Chen D., Cafiero G., Amato M., Bitella G., Rossi R., Basso F.. 2009. Landscape Position and Precipitation Effects on Spatial Variability of Wheat Yield and Grain Protein in Southern Italy. *Jour. Agronomy. and Crop Science.*, (195) 301–312

Ritchie J.T. and **B. Basso**. 2008. Water Use Efficiency is NOT Constant when Crop Water Supply is Adequate or Fixed: The Role of Agronomic Management. *European. J. Agron.* 28, 273–281

Metzidakis I.; Martinez-Vilela A.; Castro Nieto G.; **Basso, B.** 2008. Intensive olive orchards on sloping land: Good water and pest management are essential. *Journal of Environmental Management* Volume: 89 Issue: 2 120 -128

Amato, M. **B.Basso**, G. Bitella, R.Rossi, G.Celano, G.Morelli. 2008. In-situ detection of tree root distribution and biomass with multi-electrode resistivity imaging. *Tree Physiology*, 28, 1441–1448

Bertocco, M., **B. Basso**, L. Sartori, E.C. Martin. 2008. Evaluating energy efficiency of site-specific tillage in maize in NE Italy. *Bioresource Technology* 99 (2008) 6957–6965.

Basso B, Bertocco M, Sartori L, Martin, E.C. 2007. Analyzing the effects of climate variability on spatial pattern of yield in a maize-wheat-soybean rotation. *Eur J. Agron.* 26 (2): 82-91

Martin, E. K. A.Tanksley, D.C. Slack, **B. Basso**. 2006. Effects of fresh and composted dairy manure applications on alfalfa yield and the environment in Arizona. *Agron. J.* 98: 80–84

Sartori L; Basso B; Bertocco M. 2005. Energy use and economic evaluation of a three year crop rotation for conservation and organic farming in NE Italy. *Biosystems Engineering*_Vol. 91 2: Pages: 245-256

Basso, B., J.T. Ritchie. 2005. Impact of compost, manure and inorganic fertilizer on nitrate leaching and yield for a 6-year maize-alfalfa rotation in Michigan. *Agriculture Ecosystem and Environment* 108 (329-241).

Batchelor, W.D., **B. Basso**, J.O. Paz. 2002. Examples of strategies to analyze spatial and temporal yield variability using crop models. *European Journal of Agronomy* Vol. 18, pp. 141-158.

Basso, B., J.T. Ritchie, F.J. Pierce, J.W. Jones, R.N. Braga. 2001. Spatial validation of crop models for precision agriculture. *Agricultural System* 68: 97-112.

Basso, F., M. Pisante, **B. Basso**. 1998. Agronomical aspects of officinal plant cultivation. *Phytotherapy Research* 12, 1, 131-134.

Recent External Funding

- 2012. CIMMYT/Univ. of Florida, Modeling wheat in India and Sudan PI \$11.500
- 2012. PRIN Italy. Linking Long Term Observatories with Modeling to model climate change impact and adaptation strategies for Italian Cropping Systems (Euro 900,000)
- 2012. Rural Development Plan- Sustainable irrigation strategies for corn production in the Sele valley (Euro 200,000)
- 2011. Italy-Israel Exchange Grant. Xrad. Xband Radar for precipitation estimation use in Agriculture (Euro, 400,000)

2011. Climate change and Sustainable Corn based Systems PI Dr. Lois Wright Morton, NIFA, 19.992.00,00. Michigan State University Co-PI. (\$1.250.000)

2010. Climate Change Adaptation and Risk Assessments for Agriculture: Global Crop Modeling Project (GCMP). PI: Cynthia Rosenzweig (NASA-Columbia University) and James W. Jones (University of Florida). Funding Agency: USDA-USAID program US\$ (10.000.000)

2010. Impact of climate change on the agricultural ecosystems of Altay region, Russia. PI: Prof. Pivovarova (University of Moscow) Funding Agency: Russian Ministry of Research. (\$ 45.000)

2010. Implications of Climate Change and Biofuel Development for Great Lakes Regional Water Quality and Quantity. PI. Prof. Anita Thompson (University of Wisconsin) Funding Agency: USGS National Competitive Grant Program. (\$ 247.000)

2009. Row-crop ecosystems in a changing climate: enhancing ecosystem services at field, farm, and watershed scales Funded by USDA-EPA. 484.000 (US \$)

2009. Quantifying Impacts of Land Use and Climate Changes on the Terrestrial Hydrologic Cycle: Multiscale monitoring and modeling. Funded by US National Science Foundation (\$287.000)

2009. Sustainable biofuel production: future scenarios of Biogas, Bioethanol and biodiesel. Funded by Regione Emilia Romagna (\$ 45.000)

2009 Decision Support Systems for Crop Management in Basilicata. Funded by Alsia-Regione Basilicata (\$ 110.000)

2008. PRIN: Relationship between greenhouse gas emissions and yield in wheat Funded by Italian Ministry of Research MIUR (\$52.000)

2007. FISR - “Sustainable Feed production to improve water buffalo feed”. Funded by Italian Ministry of Research MIUR (\$ 420.000)

2007. MOONRISE Archimed-Intereg - “Monitoring Desertification”. Funded by EU Interreg program (295.000)

2007. FUTUREFARM – “The farm of tomorrow”. Funded by FP7 - EU (\$80.000)

SICERME - “Integrated Cereal Systems in South Italy: Sistemi integrati per i cereali nel meridione”. Funded by Italian Min. Agriculture (\$65.000)

AGRICOLTURA DI PRECISIONE - “Precision and Conservation Agriculture in Veneto”. Funded by Regione Veneto (\$58.000)

PRIN – “Ecohydrology”. Funded by Italian Ministry of Research MIUR (37.000 Euro)

TERRAE – “Modelling 3-d soil water balance”. Funded by Research Office Università della Basilicata (\$18.000)