

# Andrew McDonald

New York State Water Resources Institute  
Department of Earth and Atmospheric Sciences  
Cornell University  
1115 Bradfield Hall  
Ithaca, NY 14853 USA  
Fax: 607-255-2106  
[ajm9@cornell.edu](mailto:ajm9@cornell.edu)

## EDUCATION

**Ph.D.** (2003), Cornell University, Field of Crop and Soil Sciences (minor: water resources)  
Dissertation: *Optimizing agronomic practices for rice-wheat systems on valley terraces*

**M.S.** (1998), Cornell University, Field of Crop and Soil Sciences (minor: environmental information systems)  
Thesis: *Evaluating the impact of climate on maize – *Abutilon theophrasti* interactions in New York State.*

**B.S.** (1994), Cornell University, Department of Development Sociology

## APPOINTMENTS

Oct 2007 – present	<b>Research Coordinator</b> , New York State Water Resources Institute
July 2006 – present	<b>Research Associate</b> , Department of Earth & Atmospheric Sciences, Cornell University
May 2005 – May 2007	<b>Research Fellow</b> , National Research Initiative (NRI – USDA),
Aug 2003 – June 2006	<b>Post-Doctoral Research Associate</b> , Department of Earth & Atmospheric Science, Cornell University
Sept 2002 – July 2003	<b>Project Scientist</b> , Department of Earth & Atmospheric Science, Cornell University
May 2002 – Aug 2002	<b>Soil Scientist</b> , Natural Resources Conservation Service
Jan 1996 – May 2002	<b>Graduate Research and Teaching Assistant</b> , Department of Crop & Soil Sciences, Cornell University

## AREAS OF EXPERTISE

- agricultural soil and water management · cropping systems ecology · weed competition
- plant-soil-atmosphere water relations · applied soil physics · geographic information systems
- decision support systems & software

## PUBLICATIONS

Berger, A.G., **McDonald, A.J.**, Riha, S.J., 200x. Does soil nitrogen affect early competitive traits of annual weeds with respect to maize? *Weed Research* (accepted).

Jirka, S., **McDonald, A.J.**, Johnson, M.S., Feldpausch, T.R., Couto, E.G., Riha, S.J., 2007. Soil hydrology affects forest stand structure and vegetation zonation in the southern Amazon Basin. *Journal of Vegetation Science* 18:183-194.

Berger, A.G., **McDonald, A.J.**, Riha, S.J., 2006. Scaling plant size to belowground zone of influence in annuals under contrasting competitive environments. *Functional Ecology* 20:770-777.

Feldpausch, T.R., **McDonald, A.J.**, Passos, C.A.M., Lehmann, C.L., Riha, S.J., 2006. Timber, forest structure, and harvestable areas estimated *in situ* and with satellite imagery in southern Amazonia. *Forest Ecology and Management* 233:121-132.

**McDonald, A.J.**, Riha, S.J., Duxbury, J.M., Lauren, J.G., 2006. Wheat responses to novel rice cultural practices and soil moisture conditions in the rice-wheat rotation of Nepal. *Field Crops Research* 98(2/3):116-126.

**McDonald, A.J.**, Hobbs, P.R., Riha, S.J., 2006. Does the system of rice intensification outperform conventional best management? A synopsis of the empirical record. *Field Crops Research* 96(1):31-36.

**McDonald, A.J.**, Riha, S.J., Duxbury, J.M., Steenhuis, T.S., Lauren, J.G., 2006. Soil physical responses to novel rice cultural practices in the rice-wheat system: comparative evidence from a swelling soil in Nepal. *Soil & Tillage Research* 86(2):163-175.

**McDonald, A.J.**, Riha, S.J., Duxbury, J.M., Steenhuis, T.S., Lauren, J.G., 2006. Water balance and rice growth responses to direct seeding, deep tillage, and landscape placement: findings from a valley terrace in Nepal. *Field Crops Research* 95(2/3):367-382.

**McDonald, A.J.**, Riha, S.J., Mohler, C.L., 2004. Mining the record: historical evidence for climatic influences on maize – *Abutilon theophrasti* competition. *Weed Research* 44:439 – 445.

**McDonald, A.J.**, Riha, S.J., 2003. Event-driven phosphorous loading in the Owasco Lake watershed. Department of Earth & Atmospheric Sciences, Cornell University.

**McDonald, A.J.**, Riha, S.J., 1999. Model of crop-weed competition applied to Maize-*Abutilon theophrasti* interactions. I. Model description and evaluation. *Weed Research* 39:355-369.

**McDonald, A.J.**, Riha, S.J., 1999. Model of crop-weed competition applied to Maize-*Abutilon theophrasti* interactions. II. Assessing the impact of climate: implications for economic thresholds. *Weed Research* 39:371- 381.

## RECENT PRESENTATIONS

**McDonald, A.J.**, Riha, S.J., 2007. The evolution of crop-weed hierarchies: assessing and predicting the intensity of competition in maize. ASA-CSSA-SSSA 2007 International Annual Meetings, Nov 4-8, New Orleans, Louisiana.

Berger, A.G., **McDonald, A.J.**, Riha, S.J., 2007. The role of weed competition in crop water use efficiency. ASA-CSSA-SSSA 2007 International Annual Meetings, Nov 4-8, New Orleans, Louisiana.

**McDonald, A.J.**, 2007. Introductory Remarks, Symposium – Agronomy matters: achieving the Millennium Development Goals in rice-based agriculture. ASA-CSSA-SSSA 2007 International Annual Meetings, Nov 4-8, New Orleans, Louisiana.

**McDonald, A.J.**, Riha, S.J., DiTommaso, A., Berger, A., 2007. Climate, height hierarchies and the dynamics of competition: predicting and assessing variable interference patterns in maize. *Weed Science Society of America Annual Meeting*, San Antonio, Texas.

**McDonald, A.J.**, 2006. Yield gaps in rice: the context for integrated crop management. *Lead Panelist for Integrated Crop Management (ICM) Workshop, 2006 International Rice Congress*, New Delhi, India.

**McDonald, A.J.**, Hobbs, P.R., Riha, S.J., 2006. Productivity, promotion, and the System of Rice Intensification (SRI): a case for caution in the process of agricultural innovation. *Invited Presentation at the World Congress of Soil Science*, Philadelphia, PA.

Berger, A.G., **McDonald, A.J.**, Riha, S.J., 2006. Do high-density weed infestations contribute to the severity of drought stress in maize? *Weed Science Society of America Annual Meeting*, New York, New York.

**McDonald, A.J.**, Hobbs, P.R., Riha, S.J., 2005. Does the system of rice intensification outperform conventional best management? A synopsis of the empirical record. *American Society of Agronomy Annual Meeting*, Salt Lake City, Utah.

Berger, A.G., **McDonald, A.J.**, Riha, S.J., 2005. Root development of *Amaranthus retroflexus* L. and *Abutilon theophrasti* Medic. grown in monoculture or in competition with maize. *Weed Science Society of America Annual Meeting*, Honolulu, HI.

**McDonald, A.J.**, Jirka, S., Feldpausch, T.R., Riha, S.J., Passos, C., Lehmann, C.L., 2004. Application of remote sensing tools to identify forest composition and seasonal dynamics in NW Mato Grosso. *III LBA Scientific Conference*, Brasilia, Brazil.

## SOFTWARE

**McDonald, A.J.**, Riha, S.J., Rebel, K.T., Blake, J., 2004. Potential irrigation and phytoremediation estimator for the SRS. (decision support for optimized tritium management, USDA Forest Service).

Riha, S.J., Rossiter, D., Simoens, P, et al. (many cooks, including **McDonald** for competition module). GAPS (General-purpose simulation model of the Atmosphere-Plant-Soil system). Cornell Research Foundation.

## GRANTS

**McDonald, A.J.**, Riha, S.J., DiTommaso, A., DeGaetano, A. 2007. Climate change and the distribution of noxious and invasive weeds in maize: delineating the geography of damage with bioclimatic niche models. *NCER – STAR* (\$362,344 – pending approval).

Riha, S.J., **McDonald, A.J.**, Berger, A., 2004. Utilizing interpolated climate surfaces and simulated nitrogen dynamics for spatially-distributed predictions of weed competitiveness. *Computational Agricultural Initiative* (USDA special project) – Cornell University (\$12,400).

**McDonald, A.J.**, 2004 (RFA), Principal Investigator. Climate, height hierarchies, and the dynamics of weed competition: understanding and predicting variable interference patterns in maize. *USDA-NRI* (awarded \$109,400).

**McDonald, A.J.**, Riha, S.J., 2003. Climate and weed management in maize-based cropping systems. *Agroecosystems Project* (USDA special project) – Cornell University (\$12,300).

## TEACHING

**Guest Lecturer**, Weed Ecology (CSS 614), Cornell University, 2007. *Environmental factors, competition hierarchies, and crop interference from agricultural weeds*

**Guest Lecturer**, Weed Ecology (CSS 614), Cornell University, 2005. *Threshold management for post-emergence weed control: a concept in search of relevance.*

**Guest Lecturer**, Principles and Practice of Agro-forestry (HORT 415), Cornell University, 2004. *Landscape and soils evaluation for agroforestry applications.*

**Guest Lecturer**, Plant-Plant Interactions (HORT 462), Cornell University, 1998 – 2000. *Threshold management for post-emergence weed control: possibilities and limitations.*

**Lead Teaching Assistant**, Introductory Soil Science (CSS 260), Cornell University, 2001. *Designed four new learning modules and coordinated all laboratory exercises.*

**Lead Teaching Assistant**, Environmental Biophysics (CSS 483), Cornell University, 2000.

## PROFESSIONAL ACTIVITIES

**Peer manuscript reviewer:** *Agriculture, Ecosystems, & Environment; Ecological Research; Paddy Water & Environment; Soil & Tillage Research; Journal of Agronomy and Crop Science; Journal of Agricultural Science; Agricultural Systems; Weed Research; Australian Journal of Experimental Agriculture*

**Lead author** for the World Bank's *International Assessment of Agricultural Science and Technology for Development* (IAASTD) – forthcoming 2008

**Expert reviewer** for the *Comprehensive Assessment of Water Management in Agriculture*

**Proposal reviewer** USDA-NRI (Soil Processes), ARS – USDA

**Member** Agronomy Society of America (ASA) / Weed Science Society of America (WSSA)