

Steven J. Thomson

Education:

Ph.D., Agricultural Engineering, University of Florida, Gainesville.

M.S., Agricultural Engineering, University of Georgia, Athens.

B.S., Agricultural Engineering, University of Georgia.

Experience:

August 1997 - present: Research Agricultural Engineer, Application and Production Technology Research Unit, USDA, ARS, Stoneville, MS; Adjunct Professor with the Ag. and Bio. Engineering Department, Mississippi State University, Starkville, MS.

June 1996 - August 1997: Research Agricultural Engineer, U.S. Cotton Ginning Lab, USDA, ARS, Stoneville, MS.

August 1995 - May 1996: Assistant Professor, Division of Engineering Fundamentals. (Research adjunct with Biological Systems Engineering Dept), Virginia Polytechnic Institute and State University, Blacksburg, VA.

April 1990 - August 1995: Assistant Professor, Biological Systems Engineering Dept, Virginia Polytechnic Institute and State University.

Selected Professional Accomplishments:

At Virginia Tech, Dr. Thomson was involved with development of decision support systems for agricultural management and safety. He received both the Outstanding Faculty Award for Research from the Virginia Chapter of Alpha Epsilon (1995) and the Outstanding Faculty Award for Teaching from the Student Branch of the ASABE (1995). He was a Top Ten finalist out of 280 College of Engineering faculty for the W. E. Wine Dean's Excellence in Teaching Award (1996).

In his present position with the USDA-ARS, Dr. Thomson has developed remote sensing systems for agricultural aircraft using continuous georeferencing and has studied remote sensing techniques for detecting weeds, damage caused by spider-mite infestation, the onset of crop water stress using thermal imagery, and algae populations in catfish ponds in cooperation with scientists and engineers of the USDA-ARS, Mississippi State University, and Texas A&M University. He has current or pending cooperative agreements with several companies including GeoData Airborne Mapping & Measurement, Weir, MS; Houma Avionics, Houma, LA; Bishop Equipment, Hatfield, PA; Ag-Nav Inc., Newmarket Ontario, Canada. He developed and tested control algorithms for an isokinetic active sampler used in spray drift research, has conducted research on variable rate aerial application systems, and has conducted field studies to determine efficacy of applied spray and to quantify off-target spray drift. Dr. Thomson has published the first successful evaluation of a variable-rate controller for aerial application and a user-oriented evaporation pan for irrigation scheduling of cotton in fine textured soils of the Midsouth, U.S.

Selected Professional Invitations:

1. First Asian Conference on Precision Agriculture, Toyohashi, Japan (2005). Keynote lecture “Challenges and solutions for low altitude monitoring of crop status using thermal and reflective techniques.”
2. Invited lecture “Novel Remote Sensing Methods and Status of Precision Agriculture Research in the U.S.” Hosted by Dr. Katsuyuki Tanaka, Faculty of Bio-Production and Environmental Sciences, Kitasato University, Towada, Aomori Japan (2007).
3. Pesticide Coordinators’ Meeting, U.S. Forest Service, Spokane, WA (2006). Invited talks entitled “Variable Rate Aerial Application Technology” and “Innovative Spray Nozzles.”
4. Minority Serving Institutions Research Partnerships Conference (MSIRP), The University of Texas-Pan American, Edinburg, TX (2006). Invited talk entitled “Targeted opportunities - Information Analysis and GIS in Agriculture.”
5. Mississippi Agricultural Aviation Association Meeting, Philadelphia, MS (2008). Invited talk “Aerial Application for Control of Soybean Rust.”
6. Spray Efficacy Research Group/Canadian Agricultural Aviators Assn., Halifax, Nova Scotia Canada (2008). Invited talk for both groups “Flow Control Systems for Aerial Application – Advances and Concerns.”
7. Keynote talk “Accessible remote sensing for site-specific agricultural management.” Symposium on Remote Sensing for Precision Agriculture, College Station, TX (2008)
8. Invited presentation to the National Engineering Research Center for Information Technologies in Agriculture (NERCITA), Beijing, China on CPSRU activities in remote sensing to support site-specific crop management, hosted by Dr. Huang Wenjiang (2009).
9. Invited presentation to scientists and their partners at Heilongjiang Longken General Aviation, Jiamusi, China on the potential for use of electronic flow controllers and variable-rate application systems on agricultural aircraft, hosted by Dr. Wang Xi (2009).

Selected Professional Activities:

Chair, IET-215 Simulation Technical Committee, ASABE (1994); Vice-Chair (1993)

Chair, IET-353 Instrumentation and Controls Technical Committee, ASABE (1998)

Group Leader, IET-30 Electronics and Instrumentation Systems, ASABE (2000-2001)

Chair, PM-23/6 Application Systems Committee, ASABE (2002-2003).

Chair, M-113 Engineering Concept of the Year Awards Committee, ASABE, 2005-2006.

Chair, PM-54 Precision Agriculture, ASABE, 2006-2008; Program Chair, 2004-2006.

Associate Editor (IET Division) for Transactions of the ASABE and Applied Engineering in Agriculture (1997-2003); PM Division (2003-present).

Consulting Editor, Engineering and Structures Division, HortTechnology Journal.

Panel Member, USAID (U.S. Agency for International Development) Competitive Grants Program, Washington, D.C. 1990, 1994.

Panel Manager, Small Business Innovation Research (SBIR) Plant Production and Protection Competitive Grants Panel, USDA, ARS, CSREES, Washington, D.C., U.S., 2009-2010.

Panel Member, National Research Initiative (NRI) Competitive Grants program,
Watershed Resources Review Panel, USDA, ARS, CSREES, Washington, D.C.,
2005.

Selected Publications:

Thomson, S.J., L.A. Smith, and J.E. Hanks. 2009. Evaluation of application accuracy and performance of a hydraulically operated variable-rate aerial application system. *Transactions of the ASABE* 52(3): 715-722.

Thomson, S.J. and L.A. Smith. 2008. Crop dusting using GPS. *IEEE Aerospace and Electronic Systems* 23(3): 14-17.

Thomson, S.J., L.A. Smith, and J.E. Hanks. 2007. An instrumentation platform and GPS position latency issues for remote sensing on agricultural aircraft. *Transactions of the ASABE* 50(1): 13-21.

Fritz, B.K., W.C. Hoffmann, D.E. Martin, and S.J. Thomson. 2007. Aerial application methods for increasing spray deposition on wheat heads. *Applied Engineering in Agriculture* 23(6): 709-715.

Thomson, S. J. 2007. Agricultural aircraft for site-specific agriculture. *Agricultural Aviation* 34(5): 28-29.

Thomson, S.J., Fisher, D.K. 2006. Calibration and use of the UGA EASY evaporation pan for low frequency sprinkler irrigation of cotton in a clay soil. *Journal of Cotton Science* 10:210–223

Thomson, S.J., Zimba, P.V., Bryson, C.T., Alarcon, V.J. 2005. Potential for remote sensing from agricultural aircraft using digital video. *Applied Engineering in Agriculture*. 21(3):531-537.

Smith, L.A. and S.J. Thomson. 2003. USDA-ARS Research in Application Technology for Pest Management. *Pest Management Science* 59(6-7): 699-707.

Thomson, S.J., J.E. Hanks, and G.F. Sassenrath-Cole. 2002. Continuous geo-referencing for video-based remote sensing on agricultural aircraft. *Transactions of the ASABE* 45(4): 1177-1189.

Thomson, S.J. and B.L. Brazil. 2002. Evaluation of a low-cost, high capacity, thermocouple selection unit. *Applied Engineering in Agriculture* 18(4): 505-511.

Thomson, S.J. and L.A. Smith. 2000. Evaluation of a control system for isokinetic hi-volume sampling of airborne spray. *Applied Engineering in Agriculture* 16(3): 309-314.

Thomson, S.J., J.A. Thomasson, and D. Whitelock. 1999. Mass flow assessment of particulate in lint cleaner waste - Sensor evaluation and model adaptation. *Transactions of the ASABE*, 42(2): 513-521.

Thomasson, J.A., S.J. Thomson, R.K. Byler, D.A. Pennington, H.C. Pringle, and E.P. Columbus. 1999. Cotton mass flow measurement: Experiments with two optical devices. *Applied Engineering in Agriculture*. 15(1): 11-17.

Thomson, S.J., W.S. Anthony, and G.J. Mangialardi. 1998. Evaluation of the Shirley Trash Separator for measuring foreign matter content in lint cotton. *Applied Engineering in Agriculture*. 14(3): 231-237.

Thomson, S.J. 1998. Expert systems for self-adjusting process simulation. In *Agricultural Systems Modeling and Simulation*. R.B. Curry and R.M. Peart, eds. 157-195. Marcel Dekker, N.Y., N.Y.

Thomson, S.J., T.M. Younos, and K. Wood. 1996. Evaluation of calibration equations and application methods for the Watermark granular matrix soil moisture sensor. *Applied Engineering in Agriculture*. 12(1): 99-103.

Thomson, S.J. and B.B. Ross. 1996. Dynamic parameter adjustment method for a model-based irrigation management system. *Computers and Electronics in Agriculture*. 14:269-290.

Thomson, S.J. 1996. Decision support system to interpret soil moisture sensor readings for crop water management. *AI Applications*. 10(1):57-66.