

Name: Miguel Cabrera

Rank: Professor and Graduate Coordinator

% Salary Budgeted: Instr. 25 Res. 75 Ext. Outreach

Program Overview: Nitrogen and phosphorus cycling in soils fertilized with animal manures; runoff water quality from grasslands.



Education: Ph.D. Agronomy, Kansas State University, December 1986
M.S. Computer Science, Kansas State University, December 1989
M.S. Agronomy, Kansas State University, December 1982
B.S. Agronomy, Universidad de la Republica, Uruguay, 1978

Employment: Agroecologist, Professor, Crop & Soil Sciences, UGA, 2000-Present
Agroecologist, Assoc. Prof., Crop & Soil Sciences, UGA, 1995-2000
Agroecologist, Asst. Prof., Crop & Soil Sciences, UGA, 1990-1995
Post-doctoral researcher, Kansas State University, 1986-1990
Graduate Research Assistant, Kansas State University, 1980-1986

Membership in Professional Societies: Soil Science Society of America
American Society of Agronomy
Soil and Water Conservation Society

Awards: 2001 Fellow of the American Society of Agronomy
2002 Fellow of the Soil Science Society of America

Contributions to Teaching (1999-2005)

(1) **Undergraduate**

<u>Course #</u>	<u>Title</u>	<u>Times taught</u>	<u>Avg. # of Students</u>
CRSS 4590	Soil Fertilty and Plant Nutrition	4	50

(2) **Graduate**

<u>Course #</u>	<u>Title</u>	<u>Times taught</u>	<u>Avg. # of Students</u>
CRSS 8100	Agronomy Seminar	5	12
CRSS 8650	Nutrient Cycling Models	4	10

(3) **Service on Graduate Advisory Committees**

<u>Degree (MS/Ph.D)</u>	<u>Involvement (member/chair)</u>
8 M.S. students	Chair
13M.S. students	Member
3 Ph.D. students	Chair
23Ph.D. students	Member

Contributions to Research and Other Creative Activities (1999-2005)

Book Chapters

- Cabrera, M.L., and J.T. Sims. 2000. Beneficial uses of poultry by-products: challenges and opportunities.p. *IN* Power J.F. (Ed.) Beneficial uses of agricultural, industrial, and municipal by-products. Soil Science Society of America, Madison, WI.
- Kissel, D.E., and M.L. Cabrera. 2005. Ammonia. In Hillel, D. Encyclopedia of Soil and the Environmenta. Elsevier, Ltd., Oxford, UK.
- Cabrera, M.L., D.E. Kissel, and M.F. Vigil. 2005. Modeling the nitrogen cycle. In Sheppers, J., and W. Raun (eds.). Nitrogen in Agricultural Soils, ASA, Madison, WI.

Refereed Journal Articles

- Nissen, T.M., D.J. Midmore, and M.L. **Cabrera**. 1999. Aboveground and belowground competition between intercropped cabbage and young *Eucalyptus torelliana*. *Agroforestry Systems* 46:83-93.
- Johnson, A.D., M.L. **Cabrera**, D.V. McCracken, and D.E. Radcliffe. 1999. LEACHN simulations of nitrogen dynamics and water drainage in an ultisol. *Agron. J.* 91:597-606.
- Kuykendall, H.A., M.L. **Cabrera**, C.S. Hoveland, and M.A. McCann. 1999. Stocking method effects on nutrient runoff from pastures fertilized with broiler litter. *J. Environ. Qual.* 28: 1886-1890.
- Kuykendall, H.A., C.S. Hoveland, M.A. McCann, and M.L. **Cabrera**. 1999. Continuous versus rotational stocking of beef steers on mixed endophyte-infected tall fescue-bermudagrass pastures fertilized with broiler litter. *J. Prod. Agric.* 12:472-478.
- Marshall, S.B., M.L. **Cabrera**, L.C. Braun, C.W. Wood, M.D. Mullen, and E.A. Guertal. 1999. Denitrification from fescue pastures in the southeastern USA fertilized with broiler. *J. Environ. Qual.* 28:1978-1983.
- Andrews, S.S., L. Lohr, and M.L. **Cabrera**. 1999. A bioeconomic decision model comparing composted and fresh litter for winter squash. *Agric. Systems* 61:165-178.
- Ananyeva, N.D., T.S. Demkina, W.J. Jones, M.L. **Cabrera**, and W.C. Steen. 1999. Microbial biomass in soils of Russia under long-term management practice. *Biol. Fert. Soils* 29: 291-299.
- Worley, J.W., L.M. Risse, M.L. **Cabrera**, and M.P. Nolan, Jr. 1999. Bedding for broiler chickens: two alternative systems. *Applied Eng. in Agric.* 15:687-693.
- Wood, C.W., Marshall, S.B., M.L. **Cabrera**, and B.H. Wood. 2000. Improved method for measurement of ammonia volatilization in the field. *Commun. Soil Sci. and Plant Anal.* 31: 31:581-590.
- Worley, J.W., M.L. **Cabrera**, and L.M. Risse. 2000. Reduced levels of alum to amend broiler litter. *Applied Eng. in Agric.* 16:441-444.
- Finlay-Moore, O. P.G. Hartel, and M.L. **Cabrera**. 2000. 17 β -Estradiol and testosterone in soil and runoff from grasslands amended with broiler litter. *J. Environ. Qual.* 29:1604-1610.
- Marshall, S.B., M.D. Mullen, M.L. **Cabrera**, C.W. Wood, L.C. Braun, and E.A. Guertal. 2000. Nitrogen budget for fescue pastures fertilized with broiler litter in Major Land Resource Areas of the southeastern United States. *Nutrient Cycling in Agroecosystems* 59:75-83.
- Qafoku, O., M.L. **Cabrera**, W. R. Windham, and N.S. Hill. 2001. Rapid methods to estimate mineralizable nitrogen in broiler litter. *J. Environ. Qual.* 30:217-221.
- Fu, S., M.L. **Cabrera**, D.C. Coleman, K.W. Kisselle, C.J. Garrett, P.F. Hendrix, and D.C. Crossley, Jr. 2000. Soil carbon dynamics of conventional and no-till agroecosystems in the Georgia Piedmont - HSB-C models. *Ecological modelling* 131: 229-248.
- Egelkraut, T.M., D.E. Kissel, and M.L. **Cabrera**. 2000. Effect of soil texture on nitrogen mineralized from cotton residues and compost. *J. Environ. Qual.* 29:1518-1522.

- Meding, S.M., L.A. Morris, C.M. Hoover, W.L. Nutter, and M.L. **Cabrera**. 2001. Denitrification at a Long-Term Forested Land Treatment System in the Piedmont of Georgia. *J Environ. Qual* 30: 1411-1419.
- Cabrera**, M.L., D.E. Kissel, R.C. Davis, W.I. Segars, and N.P. Qafoku. 2001. Design and ammonia-recovery evaluation of a wind-sensitive chamber system. *Soil Sci. Soc. Am. J.* 65:1302-1306.
- Pierson, S.T., M.L. **Cabrera**, G.K. Evanylo, H.A. Kuykendall, C.S. Hoveland, M.A. McCann, and L.T. West. 2001. Phosphorus and ammonium concentrations in surface runoff from grasslands fertilized with broiler litter. *J. Environ. Qual.* 30:1784-1789.
- Pierson, S.T., M.L. **Cabrera**, G.K. Evanylo, P.D. Shroeder, D.E. Radcliffe, H.A. Kuykendall, V.W. Benson, J.R. Williams, C.S. Hoveland, and M.A. McCann. 2001. Phosphorus losses from grasslands fertilized with broiler litter: EPIC simulations. *J. Environ. Qual.* 30:1790-1795.
- Schomberg, H.H., and M.L. **Cabrera**. 2001. Modeling in situ N mineralization in conservation tillage fields: comparison of two versions of the CERES nitrogen submodel *Ecol. Model.* 145:1-15.
- Endale, D.M., M.L. **Cabrera**, J.L. Steiner, D.E. Radcliffe, W.K. Vencill, H.H. Schomberg, and L. Lohr. 2002. Impact of soil tillage and fertility management on soil water and yield in cotton fertilized with poultry litter or ammonium nitrate in the Georgia Piedmont. *Soil & Tillage Research* 66:55-68.
- Franklin, D.H., M.L. **Cabrera**, J.L. Steiner, D.M. Endale, and W.P. Miller. 2001. Evaluation of percent flow captured by a small in-field runoff collector. *Trans. ASAE* 44:551-554.
- Quemada, M., and M.L. **Cabrera**. 2002. Characteristic moisture curves and maximum water content of two crop residues. *Plant and Soil* 238:295-299.
- Chen, X., M.L. **Cabrera**, L. Zhang, J. Wu, Y. Shi, W.T. Yu, and S.M. Shen. 2002. Nitrous oxide emission from upland crops and crop-soil systems in northeastern China. *Nutrient Cycling in Agroecosystems* 62:241-247.
- Franklin, D. H., J.L. Steiner, M.L. **Cabrera**, and E.L. Utery. 2002. Distribution of Inorganic N and P stream concentrations in stream flow of two Southern Piedmont watersheds. *J. Environ. Qual.*31:1910-1917.
- Endale, D.M., D.E. Radcliffe, J.L. Steiner, and M.L. **Cabrera**. 2002. Drainage characteristics of a Southern Piedmont soil following six years of conventionally-tilled or no-till cropping systems. *Trans. ASAE* 45: 1423-1432.
- Vigil, M.F. B. Eghball, M.L. **Cabrera**, B.R. Jakubowski, and J.G. Davis. 2002. Accounting for seasonal nitrogen mineralization: an overview. *J. Soil Water Cons.* 57:464-469.
- Egelkraut, T.M., D.E. Kissel, M.L. **Cabrera**, and W. Adkins 2003. Predicting N mineralized in a Georgia Coastal Plain Field. *Nutrient Cyling in Agroecosystems* 66:1-12.
- Bonito, G.M., D.C. Coleman, B.L. Haines, and M.L. **Cabrera**. 2003. Can nitrogen budgets explain differences in soil nitrogen mineralization rates of forest stands along an elevation gradient? *Forest Ecology and Management* 176:563-574.
- Chen, X., M.L. **Cabrera**, L. Zhang, Y. Shi, and S.M. Shen. 2003. Long-term decomposition of organic materials with different carbon/nitrogen ratios. *Commun. Soil Sci. Plant Anal.* 34:43-56.
- Szajdak, L., M.L. **Cabrera**, and A. Jezierski. 2003. Impact of conventional and no-till management on soil's amino acids, stable and transient radicals, and properties of humic and fulvic acids. *Organic Geochemistry* 34:693-700
- Jackson, B.P., P.M. Bertsch, M.L. **Cabrera**, J.J. Camberato, J.C. Seaman, and C.W. Wood. 2003. Trace element speciation in poultry litter. *J. Environ. Qual.* 32:535-540.
- Egelkraut, T.M., D.E. Kissel, M.L. **Cabrera**, G.J. Gascho, and W. Adkins. Nitrogen concentration in cottonseed as an indicator of N availability. 2004. *Nutr. Cycl. Agroecosyst.* 68:235-242.

- Gilmour, J.T., M.A. Koehler, M.L. **Cabrera**, L. Szajdak, and P.A. Moore, Jr. 2004. Alum treatment of poultry litter: decomposition and nitrogen dynamics. *J. Environ. Qual.* 33: 402-405.
- Tasistro, A., M.L. **Cabrera**, and D.E. Kissel. 2004. Water soluble phosphorus released by poultry litter: effect of extraction pH and time after application. *Nutrient Cycling in Agroecosystems* 68:223-234.
- Kissel, D. E., **M. L. Cabrera**, N. Vaio, J. R. Craig, J. A. Rema, and L. A. Morris. 2004. Rainfall Timing and Ammonia Loss from Urea in a Loblolly Pine Plantation. *Soil Sci. Soc. Am. J.* 68: 1744-1750.
- Kruse, J., D.Kissel, and M. **Cabrera**. 2004. Effects of drying and rewetting on C and N mineralization in soils and incorporated residues. *Nutr. Cycl. Agroecosyst.* 69:247-256.
- McVay, K.A., D.E. Radcliffe, M.L. **Cabrera**, and G. Hoogenboom. 2004. Water balance of a dairy loafing lot using geotextile and its impact on water quality. *J. Soil and Water Conserv.* 59:142-148.
- McVay, K.A., D. E. Radcliffe, L.T. West, and M.L. **Cabrera**. 2004. Anion exchange in saprolite. *Vadose Zone Journal* 3: 668-675.
- Shroeder, P.D., D.E. Radcliffe, and M.L. **Cabrera**. 2004. Rainfall timing and poultry litter application rate effects on phosphorus loss in surface runoff. *J. Environ. Qual.* 33:2201-2209.
- Shroeder, P.D., D.E. Radcliffe, M.L. **Cabrera**, and C.D. Belew. 2004. Relationship between soil test phosphorus and phosphorus in runoff: effects of soil series variability. *J. Environ. Qual.* 33:1452-1463.
- Min Liu, D. E. Kissel, P. F. Vendrell, and **M. L. Cabrera**. 2004. Soil Lime Requirement By Direct Titration with Calcium Hydroxide. *Soil Sci. Soc. Am. J.* 2004 68: 1228-1233.
- Tasistro, A., P. Vendrell, M. **Cabrera**, and D. Kissel. 2004. Effect of storage by freezing on concentrations of molybdate-reactive phosphorus in poultry litter extracts. *Commun. Soil Sci. Plant Anal.* 35:719-733.
- Franklin, D.H., M.L. **Cabrera**, and V.H. Calvert. 2005. Fertilizer source and soil aeration effects on runoff volume and quality in grassed plots. *Soil Sci. Soc. Am. J.* 70:84-89.
- Cabrera**, M.L., D.E. Kissel, and M.F. Vigil. 2005. Nitrogen mineralization from organic residues: research opportunities. *J. Environ. Qual.* 34:75-79.
- Liu, M., D.E. Kissel, M.L. **Cabrera**, and P.F. Vendrell. 2005. Soil lime requirement by direct titration with a single addition of calcium hydroxide. *Soil Sci. Soc. Am. J.* 69:522-530.
- Cabrera**, M.L., D.E. Kissel, N. Vaio, J.R. Craig, J.A. Rema, and L.A. Morris. 2005. Loblolly pine needles retain urea fertilizer that can be lost as ammonia. *Soil Sci. Soc. Am. J.* 69:1525-1531.
- Byers, H., M.L. **Cabrera**, M.K. Matthews, D. H. Franklin, J.G. Andrae, D.E. Radcliffe, M.A. McCann, H.A. Kuykendall, C.S. Hoveland, and V.H. Calvert II. 2005. Phosphorus, sediment, and E.coli loads in unfenced streams of the Georgia Piedmont, USA. *J. Env. Qual.* 34:2293-2300.
- Schomberg, H.H., D. E. Endale, A. Calegari, R. Peixoto, M. Miyazawa, and M.L. **Cabrera**. 2005. Influence of cover crops on potential nitrogen availability to succeeding crops in a Southern Piedmont soil. *Biol. Fertil. Soils* 42:299-307.
- Abrahamson, D.A., D.E. Radcliffe, J.L. Steiner, M.L. **Cabrera**, J.D. Hanson, K.W. Rojas, H.H. Schomberg, D.S. Fisher, L.Schwartz, and G. Hoogenboom. 2005. Calibration of the Root Zone Water Quality Model for simulating tile drainage and leached nitrate in the Georgia Piedmont. *Agron. J.* 97: 1584-1602.

Sources of Grants/amounts (1999-2005):

- Ammonia volatilization from urea fertilizer applied to pine plantations.* D.E. Kissel, , M.L. Cabrera, and L.A. Morris. January 1999-December 2002, Georgia Traditional Industries Program, \$40,000 (40%).
- Ammonia volatilization from urea fertilizer applied to pine plantations.* D.E. Kissel, , M.L. Cabrera, and L.A. Morris. January 1999-December 2002, Goldkist, \$45,000 (40%).
- Ammonia volatilization from urea fertilizer applied to pine plantations.* D.E. Kissel, , M.L. Cabrera, and L.A. Morris. January 1999-December 2002, Forestry Companies, \$33,500 (40%).
- Ammonia volatilization from urea and urea/thio mixtures.* D.E. Kissel and M.L. Cabrera. January 1999-December 1999, Tessengerlo-Kerley, \$16,000 (50%).
- Development and testing of the P-Index for Georgia.* , M.L. Cabrera, D.E. Radcliffe, C.S. Hoveland, M.A. McCann. June 2000-September 2003, USDA-NRCS, \$130,000 (40%).
- Development of a rapid field method to determine available nitrogen in broiler litter.* M.L. Cabrera. May 2000-April 2002, U.S Poultry & Egg Association. \$21,850(100%).
- Aeration to reduce phosphorus losses in runoff from pastures fertilized with broiler litter.* M.L. Cabrera and D.H. Franklin. October 2000-September 2003, U.S. Poultry & Egg Association, \$27,600 (50%).
- Monitoring water quality in experimental production systems under irrigation.* M.L. Cabrera. July 2000-December 2002, INIA-Uruguay, \$16,000 (100%).
- Fate and transport of estradiol, testosterone, Salmonella, and Camphylobacter from poultry litter applied to tilled and non-tilled cropping systems.* M.B. Jenkins, D. Endale, H. Schomberg, J.L. Steiner, D.E. Radcliffe, P.G. Hartel, and M.L. Cabrera, June 2000-May 2003, USDA-NRICGP, \$230,000 (15%).
- Single Landuse Watersheds for Accurate TMDLs - Phase II.* Bakker, M., D.E. Radcliffe, P. Hartel, M.L. Cabrera, and L.T. West. USDA, CREES. May 2002-June 2005, USDA-CSREES, \$274,061 (5%).
- Laboratory and field investigations of processes affecting phosphorus speciation and dynamics in grasslands fertilized with animal manures.* M.L. Cabrera, D.H. Franklin, K. Xia, and A. Tasistro. August 2003-July 2006, USDA NRICGP. \$308,000 (25%).
- Fate of urea and an experimental urea-based fertilizer applied to grasslands in Georgia.* M.L. Cabrera and D.E. Kissel, April 2004-March 2007, Georgia-Pacific Corporation, \$91,572 (50%).
- Using cropping alternatives to improve water quality in high nutrient status farms.* M.L. Cabrera, D.H. Franklin, J. Gaskin, and M. Risse. September 2004 - August 2007, USDA-NRCS CIG, \$60,000 (25%).
- Cropping alternatives to improve water quality in high nutrient status farms.* J.Gaskin and M.L. Cabrera. January 2005 - January 2008. USDA-SARE, \$32,137 (50%).

Contributions to Professional Service

- a. University:
- Member, University Council 2001-2005
 - Member, Faculty Affairs Committee, 2001-2003
 - Member, Educational Affairs Committee, 2001-2003
 - Member, Life Sciences University Review Committee, 2003-2005
 - Member, Graduate Council, 2003-2005
- b. College:
- Chair, Faculty Affairs Committee, 1999-2001
 - Member, International Agric.Advisory Committee, 9/2001 - Present

Chair, CAES Faculty Council, 2002-2003
Member, CAES Strategic Planning Task Force, 10/2002 - 1/200
Member, Graduate Committee of Faculty Council, 2003-2005

c. Department: Chair, Safety/Miller Bldg. Laboratories, 1990-Present
Member, Computer Committee 8/2003 - Present
Member, Executive Committee, 1/2004-Present
Graduate Coordinator, 1/1/2003-Present

d. Editorial service: Associate Editor, Agronomy Journal, November 1994 - December 2000.
Editorial Board, Nutrient Cycl. Agroecosystems, March 1997 - Present

Goals for the Next Five Years (2006-2010):

1. Continue research on management practices to reduce phosphorus runoff losses from grasslands fertilized with animal manures.
2. Continue research on phosphorus transformations in soils amended with animal manures.
3. Continue research on nitrogen mineralization from organic residues.
4. Continue research on gaseous nitrogen losses from pastures and crops fertilized with inorganic fertilizers and animal manures.
5. Continue teaching Soil Fertility, Graduate Seminar, and Nutrient Cycling Models.