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ACADEMIC TRAINING:

Ph.D. Soil and Water Science.	1997	University of Florida.
M.S. Soil and Water Science (minor Chemistry)	1991	University of Florida.
B.S. Biochemistry.	1985	University of Maryland

PROFESSIONAL EXPERIENCE:

Research Chemist (July 2003- present). *USDA Agricultural Research Service*, National Laboratory of Agriculture and the Environment (NLAE), 2110 University Blvd, Ames, IA 50011. Lead PI responsible for directing and securing funding for an agriculture air quality laboratory investigating the emissions from animal feeding operations (AFOs). Duties include development of field sampling techniques for speciation of volatile organic and volatile sulfur compounds in both vapor and particulate phases and determining both emission inventories and reactivity of volatile material emitted from AFOs. Field and laboratory sampling techniques developed include thermal desorption, headspace SPME, canisters, and honeycomb denuders. Laboratory methods of analysis include GC/MS/O (olfactometry) and GC/MS/PFPD (pulsed flame photometric detector), IC, and LC/MS/MS (Ion Trap). Research is performed at both the laboratory scale with controlled environmental chambers and field scale with monitoring of emissions from animal facilities. Work in an interdisciplinary team consisting of agronomist, engineers, microbiologists, animal physiologist and nutritionist.

Senior Research Chemist (Oct 1997 to July 2003). Environmental Fate, DuPont Crop Protection, *E.I. du Pont de Nemours and Company*, Stine-Haskell Research Center, 1090 Elkton Road, Newark, DE, 19714. Responsible for directing a laboratory program and monitoring contracted research investigating dissipation processes of agrochemicals in the environment compliant with GLP methodologies. Laboratory methods include radio-isotope techniques, HPLC, and LC/MS/MS (Ion Trap, Thermofinnigan). Specialty area was microbial transformation of crop protection products in soils and sediments. Product technical expert for several herbicides and fungicides duties included: 1) addressing technical questions and issues related to these compounds in the environment; 2) working in an interdisciplinary team for the registration of compounds in US and EU; and 3) designing of non-guideline studies for addressing specific issues related to particular compound. Additional duties included consulting with other business units concerning the environmental fate of their products.

PUBLICATIONS:

- 1 C.T. Johnston, T. Tipton, D.A. Stone, C. Erickson, and S.L. Trabue. 1991. Vibrational and electronic spectroscopic study of p-dimethoxybenzene adsorbed on Cu-montmorillonite. *Langmuir* 7: 289-293.

- 2 C.T. Johnston, T. Tipton, S.L. Trabue, C. Erickson, and D.A. Stone. 1992. Vapor phase sorption of p-xylene on Co- and Cu-exchanged SAz-1 montmorillonite. *Environ. Sci. Tech.* 26: 382-390..
- 3 Tipton, T., C.T. Johnston, S.L. Trabue, C. Erickson, and D.A. Stone. 1993. Gravimetric/FTIR apparatus for the study of vapor sorption on clay films. *Review of Scientific Instruments* 64: 1091-1092.
- 4 Trabue, S.L., X. Feng, A.V. Ogram, and L. - T. Ou. 1997. Distribution of carbofuran degradation and carbofuran degrading bacteria in soil profiles. *J. Environ. Sci. Health B32* 861-878.
- 5 Ogram, A.V., Y. - P Duan, S.L. Trabue, X. Feng, H. Castro, and L. - T. Ou. 2000. Carbofuran degradation mediated by three related plasmid systems. *FEMS Microbiol. Ecol.* 32: 197-203.
- 6 Trabue, S.L., A.V. Ogram, and L. - T Ou. 2001. Dynamics of carbofuran-degrading microbial communities in soil during three successive annual applications of carbofuran. *Soil Biol. Biochem.* 33: 75-81.
- 7 Morrica, P., Trabue, S.L., Anderson, J.J., Lawler, S., Seccia, S., Fidente, P., Swain, R., Mattson, S. 2004. Kinetics and mechanism of cymoxanil degradation in buffer solutions. *J. Agric. Food Chem.* 52:99-104,
- 8 Trabue S.L., D. E. Palmquist, T.M. Lydick, and S.K. Singles. 2006. Effects of soil storage on the microbial community and degradation of metsulfuron-methyl. *J. Agric. Food Chem.* 54:142-151.
- 9 Kerr, B.J., Ziemer, C.J., Trabue, S. L. , Crouse, J. D., and Parkin, T. B. 2006. Manure composition as affected by dietary protein and cellulose concentration. *J. Anim. Sci.* 84:1584-1592.
- 10 Trabue, S.L., J. Anhalt., and J.A. Zahn. 2006. Bias of Tedlar bags in the measurement of agricultural odorants. *J. Environ. Qual.* 35:1668-1677.
- 11 Trabue S. L., K. Scoggin, S. Tjandrakusuma, M. A. Rasmussen and P. J. Reilly. 2007. Ruminant fermentation of propylene glycol and glycerol. *J. Agric. Food Chem.* 55:7043-7051.
- 12 Sun, H., S. Trabue, W. Jackson, K. Scoggin, Y. Pan, Y. Zhao, J. A. Koziel and F. Mitloehner. 2008. Greenhouse gas and volatile organic compound emissions from dairy cows and their fresh waste. *J. Environ. Qual.* 37: 615-622

- 13 Trabue, S.L., K. Scoggin, F. Mitloehner, H. Li, R. Burns, and H. Xin. 2008. Field sampling method for quantifying sulfur compounds from animal feeding operations. *Atmos. Environ.* 42: 3332-3341.
- 14 Trabue, S. L., K.D. Scoggin, H. Li, R. Burns, and H. Xin. 2008. Field sampling method for quantification of odorants in humid environments. *Environ. Sci. Technol.* 42:3745-3750.
- 15 Kerr, B., C. Ziemer, T. Webber, S. Trabue, B. Bearson, G. Shurson, and M. Whitney. 2008. Total sulfur composition of common livestock feedstuffs using thermal combustion or inductively coupled plasma methodology. *J. Animal Sci.* 86:2377-2384.
- 16 Benny, P., G. Fugate, J. Morey, B. Twamley, and S. Trabue. 2009. Synthesis and Characterization of 5-bis(benzyl thio)-1, 3, 4-thiadiazole Complexes with *fac*- $\text{ReBr}_3(\text{CO})_3^{2-}$. *Inorg. Chim. Acta* 362: 1289–1294.
- 17 Ziemer, C.J., S. L.Trabue, B.J. Kerr, H. Stien, D. A. Stahl, and S. Davidson. 2009. Characteristics of Swine Feces and Manure as a Function of Diet after 2 and 8 Weeks. *J. Environ. Qual.* 38:2138-2146.
- 18 Webber, T. E., S.L. Trabue, C.J. Ziemer, and B.J. Kerr. 2010. Evaluation of elevated dietary corn fiber from corn germ meal in growing female pigs. *J. Animal Sci.* 88:192-201
- 19 Trabue, S.L., K. Scoggin, H. Li, R. Burns, H. Xin, and J. Hatfield. 2010. Speciation of volatile organic compounds from poultry production. *Atmos. Environ.* 44: 3538-3546.
- 20 Guo, L., R. Maghirang, E. Razote, S. Trabue, and L. McConnell. 2011. Concentrations of particulate matter in large cattle feedlots in Kansas. *J. Air Waste Manage.* 61:1025-1035.
- 21 Trabue, S. L., B. Kerr, C. Ziemer, and B. Bearson. 2011. Swine odor analyzed by both human panels and chemical techniques. *J. Environ. Qual.* 40:1510-1520.
- 22 Trabue, S.L., Scoggin, K, McConnell, L., Maghirang, R., Razote, E., and Hatfield, J., 2011. Identifying and tracking key odors associated with cattle feedlots. *Atmos. Environ.* 45:4243-4251.
- 23 Yates, S., L. McConnell, C. Hapeman, S. Papiernik, S. Gao, and S. Trabue. 2011. Managing agricultural emissions to the atmosphere: State of the science, fate and mitigation, and identifying research gaps. *J. Environ. Qual.* 40:1347-1358.
- 24 Rogovska, N., D. Laird, R. Cruse, S. Trabue, and E. Heaton. 2012. Germination tests for assessing biochar quality. *J. Environ. Qual.* 41:1014-1022.

- 25 Hernandez, G., J. Tyndall, R. Pfeiffer, T. Sauer, and S. Trabue. 2012. Odor mitigation with vegetative buffers: swine production case study. *Agric. Ecosys. Environ.* 149:154-163.
- 26 Huang, Q., McConnell, L., Razote, E., Schmidt, W., Vinyard, B., Hapeman, C., Maghirang, R., Trabue, S., Prueger, J., and Ro, K. 2013. Utilizing single particle Raman microscopy as a non-destructive method to identify sources of PM10 from cattle feedlot operations. *Atmos. Environ.* 66:17-24.
- 27 Parker, D., J. Ham, B. Woodbury, L. Cai, M. Rhoades, S. Trabue, K. Casey, R. Todd, and A. Cole. 2013. Standardization of flux chamber and wind tunnel flux measurements for quantifying volatile organic compound and ammonia emissions from area sources at animal feeding operations. *Atmos. Environ.* 66:72-83.
- 28 Bonifacio, H., R. Maghirang, E. Razote, S. Trabue, and J. Prueger. Comparison of AERMOD and WindTrax dispersion models in determining PM10 emission rates from a beef cattle feedlot. *J. Air Waste Manage.* (in revision).
- 29 Trabue, S.L., K. Scoggin, McConnell, L., H. Li, A. Turner, R. Burns, H. Xin, R. Gates, R. Maghirang, A. Hasson, S. Ogunjemiyo, and J. Hatfield. Performance of commercial non-methane hydrocarbon analyzers in monitoring polar volatile organic compounds. *J. Air Waste Manage.* (in revision).
- 30 Hasson, A., S. Ogunjemiyo, S. Trabue, S. Ashkan, K. Scoggin, J. Steele, C. Olea, S. Middala, K. Vu, A. Scruggs, L. Addala, and L. Nana. NO_x emissions from Central California dairy. *Atmos. Environ.* (in revision).
- 31 Aguilar, O., R. Maghirang, C. Rice, S. Trabue, and L. Erickson. Nitrous Oxide Emissions from a Commercial Beef Cattle Feedlot in Kansas. *Agric. Ecosys. Environ.* (in review)
- 32 Hafner, S., C. Howard, R. Muck, R. Franco, F. Montes, P. Green, F. Mitloehner, S. Trabue, L. Kung, and A. Rotz. Emission of volatile organic compounds from silage: compounds, sources, and implications. *Atmos. Environ.* (in review).
- 33 Trabue, S., and B. Kerr. Manure emissions of greenhouse gases, ammonia, odor and odorants from swine feed biofuels coproducts. *J. Environ. Qual.* (in review).
- 34 Bonifacio, H., R. Maghirang, S. Trabue, J. Prueger, L. McConnell and E. Razote. Measurement of particulate matter emission fluxes from a beef cattle feedlot using Flux-gradient technique. *J. Environ. Qual.* (in review).
- 35 Ziemer, C., S.L. Trabue, D. Stahl, S. Davidson, and B. Kerr. Effects of dietary cellulose and protein on swine cecal contents: Microbial ecology and chemistry. *Letters Microbiol. Ecol.* (in review).

- 36 Aguilar, O., R. Maghirang, and S. Trabue Laboratory evaluation of surface amendments for minimizing greenhouse gas emissions from beef cattle feedlots. Trans. ASABE (in preparation).
- 37 Kerr, B., Trabue S., C. Ziemer, and B. Bearson. Maturation of manure as affected by length of storage. Agric. Ecosys. Environ. (in preparation).
- 38 Trabue S., B. Kerr, C. Ziemer, and B. Bearson. Dynamics of microbial community structure and function in swine manure and effects on ammonia and green house gas emissions. Microbial Ecology (in preparation).
- 39 Trabue, S., J. Prueger, K. Scoggin, R. Maghirang, E. Razote, L. McConnell, K. Ro, C. Hapeman, and W. Schmidt. Ammonia emission calculations from cattle feedlots in Central Kansas. J. Environ Qual. (in preparation).

Book Chapters and Proceeding Papers:

- 40 Trabue, S.L., T.M. Crowe, and J.H. Massey. 2002. Changes in soil biomass and microbial community structure as affected by storage temperature and duration: Effect on the degradation of metsulfuron methyl. In: Pesticide Environmental Fate: Bridging the Gap between Laboratory and Field Studies. Phelps, W., and K. M. Winton (eds). ACS Sym. Series 813, American Chemical Society, Washington, DC. Chapter 14.
- 41 Koziel J.A., C.L. Lo, D. Wright, S. Trabue, and B. Kerr. 2005. The use of SPME and multidimensional GC-MS-Olfactometry system for identification of key odorants from swine manure. Proceedings of Air Waste Management Association Annual Conference, Minneapolis, MN, June 21-24, 2005. Paper #996
- 42 Ziemer, C.J., Kerr, B.J., Trabue, S. L., Crouse, J. D., and Powers, W. 2005. Manure composition as affected by dietary protein and cellulose concentration., Proceedings of Air Waste Management Association Annual Conference, Minneapolis, MN, June 21-24, 2005. Paper #1170.
- 43 Koziel J.A., S. Hoff, S. Trabue, and B. Kerr. 2005. Analysis of gases and odors associated with particulate matter in swine barns using SPME-GC-MS-Olfactometry. ASAE Annual International Meeting, Tampa, FL, July 31-Aug. 4, 2005.
- 44 Trabue, S. L., K.D. Scoggin, and J. Koziel 2005. Relative humidity and its affect on the analysis of volatile fatty acids by sorbent tubes. Proceedings of Animal Agriculture and Processing: Managing Environmental Impacts. St. Louis, MO Aug. 30-Sept. 2, 2005.
- 45 Trabue, S. L., and K.D. Scoggin 2006. Measurement of volatile sulfur compounds associated with animal feeding operations. Proceedings from the "Workshop on agricultural air quality: state of the science." Sponsor The Ecological Society of America. Potomac, MD June 2006.

- 46 McConnell, L.L and S.L. Trabue. 2006. Analytical challenges in the measuring odorant emissions from animal operations. Proceedings from the "Workshop on agricultural air quality: state of the science." Sponsor The Ecological Society of America. Potomac, MD June 2006.
- 47 Trabue, S.L., H. Li, R. Burns, and H. Xin. 2007. Monitoring VOC emissions from animal feeding operations. Paper#98, National Environmental Monitoring Conference. Cambridge, MA August 20-25, 2007.
- 48 Cai, L., Koziel, J.A., Lo, Y.-C., Yang, X., Kerr, B., and Trabue, S. 2007. Effects of swine dietary treatment on odor and VOCs emitted from swine manure ASABE Annual International Meeting Paper # 074140, Minneapolis, MN June 17-21, 2007.
- 49 Sauer, Thomas, F. Haan, J. Tyndall, G. Hernandez, S. Trabue, R. Pfeiffer, and J. Singer. 2008. Wind Tunnel Evaluation of Vegetative Buffer Effects on Air Flow near Swine Production Facilities. Proceedings of Agricultural and Forest Meteorology April 2008 in Tampa, FL.
- 50 Sauer, Thomas, F. Haan, J. Tyndall, G. Hernandez, S. Trabue, R. Pfeiffer, and J. Singer. 2008. Vegetative buffers for swine odor mitigation - wind tunnel evaluation of air flow dynamics. Proceedings of Mitigating Air Emissions from Animal Feeding Operations May 19-20, 2008 in Des Moines, IA.
- 51 Trabue, S.L., B.J. Kerr, B.L. Bearson, C. Ziemer, and S. Hoff. 2008. Animal Emissions Analyzed by both Chemical and Odor Panel Methods. Proceedings of Air Waste Management Association Annual Conference. Portland, OR June 2008. Paper #289
- 52 Li, H., R. Burns, H. Xin, R. Gates, S. Trabue, D. Overhults, L. Moody, and J. Earnest. 2008. Hydrogen sulfide and nonmethane hydrocarbon emissions from broiler houses in the Southeastern United States. Paper # 084417 ASABE Annual International Meeting. Providence, RI. June 29-July 3 2008.
- 53 Trabue, S.L., L. McConnell, and R. Maghirang. 2009. Distant Odors: Identifying key odors associated with cattle feedlots downwind.. Proceedings of Air Waste Management Association Annual Conference. Detroit, MI June 16-19, 2009. Paper #113
- 54 Guo, L., R. Maghirang, E. Razote, S. Trabue, L. McConnell, and H. Bonifacio. 2009. Concentrations and size distribution of particulate matter in large cattle feedlots. ASABE Annual International Meeting. Reno, NV. June 21-24 2009.
- 55 Trabue, S., T. Sauer, T. R. Pfeiffer, G. Hernandez, and J. Tyndall. 2009. Odor mitigation with natural buffers: swine production case study. Proceedings of the 3rd International Congress on Biotechniques for Air Pollution Control. Delft, Netherlands, Sept 28-30, 2009.

- 56 Trabue, S., T. Sauer, and R. Pfeiffer. 2010. Source chemical characterization of swine odor. Proceedings of Air Waste Management Association Annual Conference. Calgary, Alberta, June 22-25, 2010. Paper #124.
- 57 Trabue, S.L., L. McConnell, and R. Maghirang. 2011. Characterizing odors from cattle feedlots with different odor techniques. Proceedings of Air Waste Management Association Annual Conference. Orlando, FL June 21-24, 2011. Paper #634
- 58 Aguilari, O., R. Maghirang, C. Rice, S. Trabue, L. Erickson, and E. Razote. 2011. Nitrous oxide emissions from commercial cattle feedlot in Kansas. Paper #1110855 Proceedings of ASABE Annual International Meeting. Louisville, KY. Aug. 8-10, 2011.
- 59 Parker, D., J. Ham, B. Woodbury, L. Cai, M. Spiels, M. Rhoades, S. Trabue, R. Todd, and N. Cole. Standardization of flux chamber and wind tunnel flux measurements for quantifying emissions from area sources at animal feeding operations. Proceedings of ASABE Annual International Meeting. Louisville, KY. Aug. 8-10, 2011.

Other Publications (*DuPont Internal Documents Accepted by Regulatory Agencies*)

Trabue, S.L., A.C. Barefoot, and Y. Li, 2000. Metsulfuron methyl: degradation of significant metabolites in water sediment systems. DuPont-4119, 28 March 2000.

Trabue, S.L., 2000. Aerobic soil metabolism of ¹⁴C-tribenuron methyl. DuPont-2288, 14 September 2000.

Trabue, S.L. and T. Lydick, 2001. Degradation of cymoxanil in two water/sediment systems. DuPont-2695, 11 July 2001.

Trabue, S.L. and T. Lydick, 2001. Degradation of rimsulfuron in two water/sediment system. DuPont-3980, 20 July 2001.

Trabue, S.L. 2001. Calculation of the quantum yield of rimsulfuron (DPX-E9636) and IN-70942 in water. DuPont-5719, 11 July 2001.

Trabue, S.L. 2002. Flupyrifluron-methyl: calculated half-lives of IN-JV460 and IN-KC576 in European laboratory and field soils. DuPont-5984 EU RV1, 23 September 2002.

Trabue, S.L., 2003. Degradation rate of [¹⁴C]cymoxanil on four soils. AMR 2869-93 SU1. 23 January 2003.

Trabue, S.L. and S.L. Mattson, 2003. Anaerobic soil metabolism of tribenuron-methyl. DuPont-7824, 23 January 2003.

Schmuckler, M.E., and S.L. Trabue 2003. Quantum efficiency for IN-R3273 and IN-JX915 in water. DuPont-9318 EU, 14 March 2003.

Trabue, S.L., 2003 Calculated half-lives of cymoxanil and its metabolites in environmental fate laboratory studies. DuPont-11575, 13 March 2003.

Hausmann, S.M., and S.L. Trabue, 2003. Anaerobic aquatic metabolism of cymoxanil. 07 July 2003.

Regulatory Correspondence and Review Documents

Anderson, J.J., and S.L. Trabue 2000. DuPont response to the Pest Management Regulatory Agency questions about Cymoxanil Technical and Curzate. 60 DF Fungicide. DuPont-4532 CA, 25 July 2000.

Cabusas, M.E.Y., Gaddamidi, V., and Trabue, S.L. 2001. Rimsulfuron Active substance Annex IIA: Section 4: Residue chemistry Checks as to the acceptability of the quality of individual study reports (Tier 1 - Document L-II). DuPont-4996 EURev8, 16 August 2001.

Trabue, S.L., and Singh, P. 2001. Rimsulfuron 25 WG plus KG691 surfactant Water-dispersible granular formulation Annex IIIA: Section 5: Fate in the environment: Summaries and assessment (Tier II - Document M-III). DuPont-8287 EURev8, 30 November 2001.

Trabue, S.L. 2002. Response to question from BBA regarding rimsulfuron metabolite reported in paper by Rouchaud et al. (Annex IIA, point 7.1.3.3). 20020601 Rimsulfuron Response to BBA IIA-7.1.3.3. 01 June 2002

Trabue, S.L. 2002. Rimsulfuron active substance Annex IIA: Section 5: Fate in the environment Checks as to the acceptability of the quality of individual study reports (Tier I - Document L-II) Revision 1. DuPont-4997 RV1 EURev8, 2 August 2002.

Trabue, S.L. 2002. Rimsulfuron active substance Annex IIA: Section 5: Fate in the environment: Summaries and Assessment (Tier II - Document M-II), 2 August 2002.

Trabue, S.L., and Singh, P. 2002. Rimsulfuron 25 WG Annex IIIA: Section 5: Fate in the environment Checks as to the acceptability of the quality of individual study reports (Tier I - Document L-III). DuPont-5009 RV1 EURev8, 2 August 2002.

Trabue, S.L., and Singh, P. 2002. Rimsulfuron 25 WG Water-dispersible granular formulation (WG) Annex IIIA: Section 5: Fate in the environment Summaries and assessment (Tier II - Document M-III). DuPont-5015 RV1 EURev8, 2 August 2002.

Trabue, S.L. 2002. Response to question from BBA (K. Aden) regarding reasons why rimsulfuron metabolite IN-J0290 should not be included in the residue definition (Annex IIA, point 7.3). 20021114 Rimsulfuron Response to BBA IIA-7.3. 14 November 2002.

Extramural Funding:

Lead PI or co-PI for nine grants and cooperative research agreements since 2006 totaling over \$1.0 million in additional funding for my group.

Active Grants:

Maghirang, R., S. Trabue, L. McConnell, J. Harner, and W. Hargrove “Characterization and measurement of air emissions from large open cattle feedlot” USDA-AFRI. March. 2009-Dec. 2013 (\$399,981).

Hasson, A., S. Ogunjemiyo, and S. Trabue. “Air Quality Impacts Of Dairy Facilities In Central California” USDA AFRI April 1, 2010-March 2014. (\$597,990).

Rosentrater, K., D. Andersen, S. Trabue, and B. Kerr. Determining swine pit foaming causes and developing mitigation strategies. Iowa Pork Producers Association. February 2012- 2014. (\$300,000).

Hasson, A., C. Hunsaker, S. Walse, S. Ogunjemiyo, S. Trabue, and S. Ashkan. Fresno State student development program to address climate challenges in agriculture. USDA AFRI Dec 15, 2012-Dec 2014 (\$150,000).

ADDITIONAL INFORMATION:

Currently, I serve as a member of the USDA ARS Animal GRACEnet (Greenhouse gas Reduction through Agricultural Carbon Enhancement network) group, Secretary of EE-6 odor committee of the Air Waste Management Association (AWMA), and I am active in the Agrochemical division of American Chemical Society where I have helped to organize and host several symposiums on agricultural air quality.

Member of:

- American Chemical Society
- Soil Science Society of America
- Air Waste Management Association
- American Association of Aerosol Research