



Australian Government
**Cotton Research and
Development Corporation**

TRAVEL & CONFERENCE REPORT

Part 1 - Summary Details

Please use your TAB key to complete Parts 1 & 2.

Project Title: Attend American Chemical Society (ACS) Agrochemicals Division International Research Award Symposium, “Don Wauchope and Friends--Reflections on the Future of Pesticide Environmental Chemistry” Washington DC and visit various USDA offices.

Project Commencement Date: Aug 2009 **Project Completion Date:** Sept 2009
Research Program: 2 Integrated Natural Resource Management

Part 2 – Contact Details

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A handwritten signature in black ink, appearing to be 'J.M. [unclear]', written in a cursive style.

Part 3 – Travel Report – minimum of 2 pages

1. A brief description of the purpose of the travel.

Attend American Chemical Society (ACS) Agrochemicals Division International Research Award Symposium, “Don Wauchope and Friends--Reflections on the Future of Pesticide Environmental Chemistry” Washington DC and present a paper, and visit various USDA offices.

Publicise the outcomes of the LWA/CRDC/MDBC ‘Pesticides in the Riverine Environment’ program and the cotton industries BMP program, and learn about the state-of-the-art in pesticide science and modelling for application in Australia. Specifically:

- To attend & present an invited paper (“What drives pesticide runoff: An empirical journey to a framework for pesticide runoff using some of Don's ideas”) to the ACS Symposium,
- To attend a symposium at the ACS AGRO meeting on ‘Simulation modeling of pesticides in the environment’, in memory of US-EPA's Larry Burns.
- To visit & present seminars with USDA pesticide scientists at Beltsville Maryland and Tifton Georgia.

Unfortunately the Larry Burns symposium was held at the same time as the Don Wauchope symposium, so I only saw a few of these papers. A list of the papers attended is attached.

2. What were the:

a) major findings and outcomes

In pesticide science, research and modelling by private companies exceeds that carried out by public organisations (e.g. USDA & EPA in the USA) – e.g. Paul Hendley (Syngenta) presented or was a co-author on 10 papers at the ACS meeting. Also consulting firms (e.g. Waterborne Environmental, Inc) now are major providers of environmental research. Aerial movement of pesticides and non-active components of pesticide formulations (e.g. solvents) have become important areas of environmental assessment. Models (eg Pesticide Root Zone Model (PRZM), Exposure Analysis Modeling System (EXAMS), Soil Water Assessment Tool (SWAT)) have become standard tools in risk assessments, evaluating management and in regulation.

Assessing water quality benefits of investments in improved land management (e.g. incentives to land holders) is a high priority (e.g. for USDA), just as is occurring in the Great Barrier Reef (GBR) catchments in Australia. Combined stream monitoring, catchment modelling and remote sensing are evolving as the preferred method, just as they are in the GBR catchments.

b) other highlights

Meeting many of the world’s experts in pesticide environmental behaviour and fate. Visiting the geology and soil exhibits at the Smithsonian. Seeing vast extent of irrigated agriculture in USA.

3. Detail the persons and institutions visited, giving full title, position details, location, duration of visit and purpose of visit to these people/places. (NB:- Please provide full names of institutions, not just acronyms.)

Discussion about pesticide behaviour, modelling and runoff:

Dr. R. Don Wauchope, Wauchope@citcom.net, United States Department of Agriculture (USDA) Agricultural Research Service (retired), Pisgah Forest, NC 28768. 4 days (drove to Tifton GA together) plus the Symposium.

Dr. Laura L. McConnell, laura.mcconnell@ars.usda.gov, & Cathleen J. Hapeman **Beltsville** Agricultural Research Center, USDA-Agricultural Research Service, Beltsville, MD. 1 day.

Discussed solid phase extraction, sampling of rainwater for chemicals, watershed monitoring and management of pesticides. Aerial movement of pesticides and non-active components of pesticide formulations have become new areas of environmental assessment for USDA. Presented seminar (1 hr).

Dr Tom Potter, tom.potter@ars.usda.gov, & Clint C. Truman, Southeast Watershed Research Laboratory, USDA-Agricultural Research Service, 2316 Rainwater Road, PO Box 748, Tifton, GA 31794. 1 day visit to Tifton.

Visited runoff and tile drainage monitoring experimental sites (tillage systems and irrigation in crop rotations); discussed use of rainfall simulation in pesticide research. Presented seminar (1 hr).

Also met (1 or more hours):

Allan S. Felsot, afelsot@tricity.wsu.edu, Department of Entomology, Washington State University, Richland, WA 99354,

Martin A. Locke, martin.locke@ars.usda.gov, National Sedimentation Laboratory, USDA-Agricultural Research Service, Water Quality & Ecology Research Unit, Oxford, MS 38655,

Rob Malone, rob.malone@ars.usda.gov, USDA-Agricultural Research Service, National Soil Tilth Laboratory, Ames, IA 50011,

Pamela J. Rice, Pamela.Rice@ars.usda.gov, Soil and Water Management Research, USDA-Agricultural Research Service, St. Paul, MN 55108

Jeffrey J. Jenkins, jenkinsj@ace.orst.edu, Environmental and Molecular Toxicology, Oregon State University, Oregon State University, Corvallis,

Jan Linders, Jan.Linders@rivm.nl, Expert Centre for Substances, Bilthoven 3720 BA, Netherlands,

Paul Hendley, paul.hendley@syngenta.com, Syngenta Crop Protection, Greensboro, NC 27410,

Mitchell Burns, m.burns@usyd.edu.au, Faculty of Agriculture, Food and Natural Resources, The University of Sydney, Sydney 2006, Australia,

Sharon Papiernik, sharon.papiernik@ars.usda.gov, USDA Agricultural Research Service, North Central Soil Conservation Research Laboratory, Morris, MN 56267,

Randy Williams, Randy.Williams@ars.usda.gov, Southeast Watershed Research Laboratory, USDA-Agricultural Research Service, Tifton, GA 31794

4. a) Are there any potential areas worth following up as a result of the travel?

Australian scientists grappling with evaluating management & modelling of water quality in Reef catchments and pesticide behaviour in sugar cane would benefit from visits to US research sites.

b) Any relevance or possible impact on the Australian Cotton Industry?

People from the Australian Cotton Industry should attend the IUPAC conference (next in Melbourne), ACS meetings (USA twice each year) and PACIFICHEM meeting to keep up with developments in pesticide science, risk assessment and regulatory approaches.

5. How do you intend to share the knowledge you have gained with other people in the cotton industry?

By attending the meeting I received an invitation to speak at the 2010 IUPAC pesticide meeting (~the World pesticide meeting) in Melbourne (www.iupacipc2010.org) and met many people on the organising committee. This is another opportunity to highlight results from the LWA/CRDC/MDBC 'Pesticides in the Riverine Environment' program and the cotton industries BMP program and work since then.



ACS INTERNATIONAL AWARD FOR RESEARCH IN AGROCHEMICALS

Presented by the AGRO Division of ACS
Co-Sponsored by BASF Corporation & DuPont Crop Protection



Dr. ROBERT DONALD WAUCHOPE

Don Wauchope has had a 35-year research career with the USDA Agricultural Research Service (ARS) using basic chemical principles to clarify the behavior of

pesticides in the environment. Following graduate study in inorganic and physical chemistry, and a postdoctoral fellowship in agricultural chemistry under Virgil Freed at Oregon State University, Don joined the ARS Southern Weed Science Laboratory at Stoneville, Mississippi in 1972 under weed scientist Chester McWhorter, later moving to the Nematology/Weed Science group at Tifton, Georgia under Bill Johnson and then the Southeast Watershed Research Laboratory at Tifton under Tim Strickland.

Initially, Don focused on arsenical pesticides and used these compounds in innovative ways as environmental tracers. This work broadened into the study of the environmental fate of a wide range of pesticides, where Don contributed significant research on the behavior of pesticides in soils, pesticide application efficiency and efficacy, and nonpoint pollution of water by agricultural pesticides. Don is the foremost

authority in the world on pesticide runoff. His 1978 review of pesticide runoff from agricultural fields is heavily cited and set the research agenda for this area. His pesticide properties database for environmental pollution prediction is in use worldwide by water-quality agencies, researchers, modelers, consultants, and industry.

Don has authored 205 papers and abstracts. He contributed to CREAMS, ARS' most famous environmental simulation model, and developed the pesticide processes modules of the ARS RZWQM and REMM models. He has been a global spokesman for the use of modeling in pesticide risk assessments. Don has been a team leader on USDA and interagency taskforces and other national projects and on international interdisciplinary research projects for the International Union of Pure and Applied Chemistry. He has served on many scientific society committees, organizing symposia and technical programs, and publishing reports on the state of technology and its interface with policy and regulatory programs. He is a Fellow of the Weed Science Society of America and Past President and Fellow of the Agrochemicals Division. Don retired in 2006 and is now consulting with the USDA Foreign Agricultural Service and the Borlaug Institute of Texas A&M University on certification of official food pesticide residue analytical laboratories in developing nations in support of agricultural trade.

A two and half day symposium entitled

Don Wauchope and Friends: Reflections on the Future of Pesticide Environmental Chemistry

will be held in Don's honor beginning Monday, August 17, at 8:15 am in the Renaissance Washington Auditorium

The AGRO Division is grateful for the sustained support of the International Award sponsors



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AGRO
 DIVISION OF AGROCHEMICALS
 Final Program, 238th ACS National Meeting, Washington, DC, August 16-20, 2009
 PROGRAM
 Sessions attended by Mark Silburn

International Award for Research in Agrochemicals: Don Wauchope and Friends--Reflections on the Future of Pesticide Environmental Chemistry

MONDAY MORNING: Award Address; Trends in Agrochemical Research

- A. S. Felsot, Organizer
- 8:15 — Introduction & Award Presentation.
- 8:30 —43. Don Wauchope and friends -- reflections on the future of pesticides environmental chemistry. J. Menn
- 8:45 —44. Award address: The environmental chemistry of agricultural pesticides. R. D. Wauchope
- 9:30 —45. Research and development of agrochemicals over the past 40 years. J. B. Unsworth
- 10:15 —46. Chemicals and chemistry in agriculture and the role of USDA-ARS. C. J. Hapeman
- 10:45 —47. Environmental research in the USDA-ARS Southern Weed Science Laboratory, Stoneville, MS: Pool tables to 21-gun salutes. M. A. Locke, R. M. Zablotowicz
- 11:15 —48. Innovations of Agrochemicals and IPM . K. Tanaka

Annual Report

MONDAY AFTERNOON: Agrochemical Properties; Runoff

- A. S. Felsot, Organizer
- 1:55 — Introductory Remarks.
- 2:00 —103. Hierarchical approach for obtaining values of physical and chemical parameters controlling the transport and fate of pesticides and their transformation products in the hydrologic system. J. E. Barbash, P. D. Capel, T. C. Hancock, K. C. Rice
- 2:30 —104. FOOTPRINT Pesticide Properties Database: why and how it was developed and its future role in environmental risk assessments. K. A. Lewis
- 3:15 —105. What drives pesticide runoff: an empirical journey to a framework for pesticide runoff using some of Don's ideas. D. M. Silburn
- 3:45 —106. Simulation models, macropores, tillage, and rainfall intensity role in pesticide transport through soil. R. Malone, M. Shipitalo, L. Ma, R. D. Wauchope, L. Ahuja, G. Fox, G. J. Sabbagh, S. Logsdon
- 4:15 —107. Field run-off and buffer performance testing: an historic tour of studies, breakthroughs and technical contributors. P. N. Coody

TUESDAY MORNING Agrochemical Leaching & Modeling

- A. S. Felsot, Organizer
- 8:25 — Introductory Remarks.
- 8:30 —127. Review of pesticide ground water issues and research. R. L. Jones
- 9:00 —128. Current and future role of adsorption studies in pesticide leaching assessment for non-structured soils. J. Boesten, W. Beltman
- 9:30 —129. Modelers getting real – linking conceptual models, algorithms and monitoring data. P. Hendley
- 10:15 —130. Improving model performance through model parameterization. Q. Ma, S. Cohen
- 10:45 —131. Modeling heterogeneous environmental systems: Evolving data needs. E. Behl
- 11:15 —132. Modeling pesticide risks: Start with ground water, go to turf, and keep going. S. Z. Cohen

TUESDAY AFTERNOON: Bioavailability; Fate

- A. S. Felsot, Organizer
- 1:55 — Introductory Remarks.
- 2:00 —150. Characterization of pesticide availability/bioavailability in soils. W. C. Koskinen
- 2:30 —151. Seeking the bridge between environmental chemistry and toxicology: Is there a relationship between physicochemical properties and body dose? A. S. Felsot
- 3:15 —152. Pesticide characteristics important to predicting volatile loss from foliar surfaces. J. J. Jenkins
- 3:45 —153. Pesticides in air – the evolving nature of agriculture air quality research. L.L. McConnell

- 4:15 —154. Pesticide environmental fate research for the 21st century: Building bridges between laboratory and field studies at varying scales . T. L. Potter

WEDNESDAY MORNING: Fate & Exposure Assessment

A. S. Felsot, Organizer

- 8:25 — Introductory Remarks.
- 8:30 —175. Pesticide environmental fate from the microbial to the international levels. K. D. Racke
- 9:00 —176. Terrestrial field dissipation study: A research tool for elucidating pesticide environmental fate. A. C. Barefoot
- 9:30 —177. Past, current and future environmental risk evaluations in the Netherlands and the European union. J. Linders
- 10:15 —178. Regulatory Modeling for Pesticide Aquatic Exposure Assessment. R. D. Parker
- 10:45 —179. Investigating riparian buffers impact on pesticide fate using the Riparian Ecosystem Management Model (REMM). R. G. Williams, R. Lowrance, R. D., Wauchope, T. L. Estes
- 11:15 —180. Water quality metrics for tracking sustainability of cropping systems. D. I. Gustafson, J. W. Frey, M. D. Matlock, R. Stewart, R. L. Jones, P. Hendley, S. H. Jackson, M. H. Russell

WEDNESDAY AFTERNOON: Advancements in Geospatial Risk Assessment and Techniques G. G. Hoogeweg, Organizer

- 1:30 —203. Geospatial risk assessment for agro-chemicals: An abridged history. G. G. Hoogeweg, C. M. Holmes
- 2:00 —204. Using GIS for spatial modelling in ecological risk assessment of agrochemicals at the catchment-scale in **Australia**. M. Burns, A. N. Crossan, G. G. Hoogeweg, A. C. Barefoot, I. R. Kennedy
- 2:30 —205. Framework for estimating exposure of ESA-listed salmon to pesticides. S. P. Cramer, N. Poletika, R. Everich, M. Schocken, C. Habig, R. Reiss
- 3:30 —206. Development of spatially explicit model inputs for evaluating ecological impacts to streams in Ohio. C. M. Holmes, B. S. Lee, S. D. Dyer, C. E. White-Hull, K. E. Kapo, A. Burton, L. Posthuma, D. de Zwart, C. Mulder
- 4:00 —207. National Scale Modeling Framework Design for Probabilistic Agrichemical Risk Assessment. P. Miller, L. Zwilling, J. M. Cheplick, C. M. Harbourt, J. J. Prenger, D. Mao

THURSDAY MORNING: Monitoring and Modeling Atrazine Ecological Exposure Potential P. Hendley, Organizer

- 8:30 — Introductory Remarks.
- 8:35 —229. Atrazine ecological exposure monitoring program: study design and conduct. C. M. Harbourt, L. S. Carver, P. Hendley, N. J. Snyder, J. R. Trask, P. Miller, E. Johnston, S. Chen
- 8:55 —230. Modeling community-level responses to atrazine in Midwestern streams. S. M. Bartell, S. K. Nair, D. C. Volz
- 9:15 —231. Identifying watersheds that potentially exceed effects-based atrazine thresholds from a multi-year monitoring study. N. Thurman, M. Corbin, M. Thawley, M. G. Frankenberry, S. Irene
- 9:35 —232. Agrochemical surface water monitoring – interpreting results from the Atrazine ecological exposure monitoring study. P. Hendley, C. M. Harbourt, P. Miller, J. J. Prenger, D. Volz
- 10:10 —233. Hybrid PRZM: combining high frequency field sampling data and simulation modeling . P. Miller, C. M. Harbourt, N. J. Snyder, P. Hendley, J. J. Prenger
- 10:30 —234. Determining the depth to a restrictive or claypan layer: National assessment at the field scale. P. Miller, J. J. Prenger, C. M. Harbourt, P. Hendley
- 10:50 —235. National SSURGO based PRZM modeling: comparative exposure potential. P. Miller, J. M. Cheplick, J. J. Prenger, L. Zwilling, D. Mao, C. M. Harbourt
- 11:10 —236. Visualization challenges in high resolution spatial assessments. C. M. Holmes, P. Miller, D. Mao, J. Amos, J. J. Prenger, C. M. Harbourt