

STEPHEN O. JACOBSON
Principal Consultant
Compliance Services International

SUMMARY OF EXPERIENCE

PROFESSIONAL EXPERIENCE

Over thirty-five years of diversified laboratory experience including heavy metals in fish and fish products; residue method development for pesticides in crops, soil, water, tissues, and environmental samples; design and execution of studies to determine the metabolic fate of pesticides in soil, crops, avian species, and mammals using radio-labeled materials; design, execution and report preparation for environmental fate studies of pesticides in the laboratory and field; technical supervisor of a Contract Laboratory Program (CLP) extractions laboratory. Managed a Federal Insecticide, Fungicide and Rodenticide Act Good Laboratory Practices (FIFRA GLP) compliant residue laboratory which specialized in analysis of pesticide residues in crops, soil, and water as well as method development and product chemistry. Familiar with testing requirements for DOT and TSCA regulated products. Currently principal consultant with responsibility for FIFRA GLP pesticide registration projects and FIFRA data compensation litigation.

35 years Agrochemical Research and Development/Environmental Chemistry

- Manage pesticide residue laboratory operations
- Manage pesticide product chemistry laboratory operations
- Development of compensability and cost arguments for FIFRA data compensation
- Preparation of testimony and exhibits for FIFRA data compensation litigation
- Residue chemistry method development and analysis
- Environmental fate and transport of pesticides
- Metabolism of pesticides in crops, soils and animals
- Assessment of pesticide tolerances in foods and feed
- Product chemistry study execution and management
- Pesticide formulation development and evaluation
- Laboratory Safety and Risk Management and Radiation Safety
- Waste Minimization and Resource Recovery Plans
- Supervise extractions laboratory for CLP environmental laboratory
- Analyze marine tissues for heavy metals, primarily mercury

CREDENTIALS

B.A. 1971 University of Washington, Chemistry

PROFESSIONAL AFFILIATIONS/APPOINTMENTS

Member - Association of Official Analytical Chemists (1985 - Present)
Member - ASTM (Formerly American Society of Testing Materials) (1989 - Present)
Member - American Chemical Society (1985 - Present)
Member - Weed Science Society of America (1998 – 2004)

PROJECT EXPERIENCE

- Principal consultant responsible for developing compensability and cost strategies for FIFRA data compensation litigation. Additionally responsible for preparation of litigation exhibits and documentation. Manager of FIFRA GLP field and laboratory studies conducted in support of pesticide registrations.
- Manager of FIFRA GLP residue laboratory responsible for all phases of laboratory and its projects. Laboratory projects included residue analysis of a variety of compounds in crops, water, soil, and product chemistry including chemical analysis and determination of physical properties. Manager of other projects including independent laboratory validation of residue methods, multi-residue method testing of pesticide products and analysis of pesticide products and unique matrices in support of legal actions.
- Principle Investigator for laboratory and field studies of the metabolism of a growth regulator in cotton plants. Study designed to determine the residues and metabolites in first generation plants and to determine the carry over of chemical into second generation plants by seed-borne residues.
- Project Manager for installation of Quality Assurance / Good Laboratory Practice programs in two contract chemical testing laboratories. Each program is designed to assure compliance with Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and Organization for Economic Cooperation and Development (OECD) guidelines. Also developed a laboratory safety and techniques manual as well as a laboratory solvent reclamation system.
- Project Manager for over 50 magnitude of the residue (RAC) (consisting of over 150 trials) and 10 magnitude of the residue in processed fraction studies (consisting of over 10 trials) including plant growth regulators, herbicides, fungicides, and insecticides. Also, designed and executed for over 30 environmental fate and metabolism studies.
- Project Manager for development and conduct of laboratory environmental fate studies to support the registration of herbicide with EPA. The studies are designed to evaluate the aqueous photolysis, soil photolysis, aged and unaged column leaching and adsorption/desorption characteristics of the compound.
- Project Manager for the field and laboratory conduct of multiple field dissipation studies to support the registration of three herbicides and three insecticides. The studies were designed to monitor the rate and mode of dissipation of the chemicals from crop and bareground treatments. Project included protocol preparation, site selection, field oversight, laboratory oversight and final report preparation.
- Principle Investigator for laboratory environmental fate investigation of a plant growth regulator. The studies assessed aqueous hydrolysis, aqueous photolysis, photolysis on soil surfaces and adsorption /desorption from four soils.
- Project Manager for the conduct of two plant metabolism studies of a herbicide in target crops. The project required the preparation of an analytical protocol followed by oversight of a contract laboratory during the analytical phase of the studies and preparation of the final report for submission to the USEPA.
- Project Manager/Principle Investigator for the development of analytical methods for various compounds in crops, meat, milk, eggs, fish, soil and water utilizing HPLC, GC and UV/Vis spectrophotometry.

- Author of the physical/chemical characteristics section of a statewide environmental impact statement used to manage aquatic herbicide use in various natural water bodies. The topics for five (5) compounds included such areas as: physical state, oxidation/reduction, flammability, explosability, storage stability, miscibility, corrosion characteristics, dielectric breakdown voltage, pH, viscosity and density.

PROFESSIONAL EMPLOYMENT

Principal Consultant (2004 - Present) Compliance Services International Tacoma, Washington

Provide chemistry and related scientific expertise for various client projects as needed. Responsible for developing compensability and cost strategies for FIFRA data compensation litigation. Additionally responsible for preparation of data compensation litigation exhibits and documentation. Manager of FIFRA GLP field and laboratory studies conducted in support of pesticide registrations.

- Managed acquisition and documentation of cost information for defense a major crop protection products in multiple FIFRA data compensation cases.
- Provided scientific arguments and technical support for expert witness in multiple data compensation cases.
- Project manager for series of RAC studies for a defoliant on cotton.
- Prepared scientific and technical documents as a part of European Union (EU) biocides dossiers.
- Prepared OPPTS guideline reports for multiple pesticide products covering product chemistry including beginning materials, production and formulation processes, impurities, certified limits and preliminary analysis.
- Prepared OPPTS guideline reports for physical/chemical characteristics for multiple pesticide products.
- Maintained contact with USEPA product managers and various staff during submission and review of pesticide petitions and ancillary submissions.

Manager, Analytical Chemistry and Field Programs (1991 - 2004) Compliance Services International Tacoma, Washington

Responsible for all aspects of the laboratory operations in compliance with FIFRA GLPs. Supervise senior personnel serving as study directors/principle investigators as well as directly supervising laboratory studies conducted by other laboratory personnel. Oversee the production and maintenance of laboratory Standard Operating Procedures (SOPs) and provide input and direction to corporate SOPs. Conduct scientific and data accuracy (QC) reviews of data generated in the laboratory.

- Planned and executed laboratory start up and provided the direct study management for the initial laboratory projects.
- Study Director/Analytical Project Coordinator for residue program in two crops ... accepted by USEPA and subject of an EPA GLP site and data audit of CSI which resulted in no adverse findings.
- Study Director for multi-site RAC studies in two crops. Coordinated field and analytical subcontractors... studies accepted by USEPA.
- Study Director for four multi-site RAC studies... accepted by USEPA.
- Analytical Project Coordinator for 16 crop residue programs... accepted by USEPA.

- Analytical Project Coordinator for three multi-site stored grain studies -- more than 2000 samples analyzed for both parent compound and a metabolite.
- Analytical Project Coordinator for three processed fraction studies in small grains analyzed for parent compound and a metabolite.
- Laboratory safety officer and building and facilities supervisor.

Manager, Environmental Services (1988 - 1991)

Compliance Services International

Tacoma, Washington

Joined Compliance Services International in 1988 at its inception. Responsible for all environmental research conducted or contracted by CSI. Supervised various scientists managing studies relating to both FIFRA pesticide registration and to RCRA and CERCLA site and hazardous materials investigations. Designed and installed FIFRA GLP-based quality assurance programs for contract chemical testing laboratories.

- Study Director for 30 field dissipation studies covering cropped and bareground applications of insecticides, herbicides, growth regulators and fungicides... all accepted by USEPA.
- Study Director and analytical method development coordinator for six RAC studies in various crops... accepted by the State of California.
- Study Monitor for laboratory environmental fate studies conducted by offshore contract laboratory under OECD/EPA guidelines... accepted by USEPA.
- Initiated and managed an environmental site investigation program supporting lending institutions and developers.
- Conducted over 25 site investigations including site history reviews, sampling program design and execution, bore hole drilling and coordination of analytical services.

Technical Supervisor, Extractions (1987-1988)

Laucks Testing Laboratories

Seattle, Washington

Served as the technical supervisor of the organic extractions laboratory, reporting to the Laboratory Director. Provided technical expertise relating to extraction methods and their development and execution. Developed a series of new methods to extract explosives, semi-volatiles, organochlorine pesticides and herbicides from grasses, small woody plants and marine tissues such as fish, clams and sea cucumbers.

- Developed novel extraction procedures for explosives and other environmental contaminants to assess contamination of a munitions transfer site.
- Documented over 40 extraction procedures to facilitate training and evaluation of new hires.
- Developed and implemented an evaluation and salary merit raise program for extractions personnel.
- Participated in the development and testing of a pilot solvent recovery system, cutting extraction solvent cost and minimizing waste by one-half.

Research Chemist (1984-1987)

Pennwalt Corporation, Agchem Division

Tacoma, Washington

Promoted to research chemist with the primary responsibility to act as the principle investigator for a series of studies to define the environmental fate of a new growth regulator. The series included hydrolysis, photolysis in aqueous solution, photolysis on soil surfaces and adsorption/desorption. Each of the studies required the use of radiolabeled material. Served as principle investigator for a series of greenhouse and field studies to

determine the metabolic fate of the growth regulator in cotton plants. These studies encompassed F1, F2 and F3 generation plants to determine the potential for chemical carry over from seed-borne residues.

- Study Director/Principle Investigator for laboratory environmental fate studies of a ¹⁴C labeled growth regulator... accepted by USEPA.
- Study Director/Principle Investigator for ¹⁴C plant metabolism/distribution studies in greenhouse cotton... accepted by USEPA.
- Conducted aerobic and anaerobic soil metabolism study of a ¹⁴C labeled fungicide... accepted by USEPA.
- Served as group radiation safety officer and on laboratory safety committee.
- Developed several water-based flowable formulations of a fungicide for laboratory and field evaluation.
- Promoted waste minimization by recycle and reuse of common solvents.

Residue Chemist (1973-1984)
Pennwalt Corporation, Agchem Division
Tacoma, Washington

Primarily responsible for method development and residue analysis of crops and their fractions, soil, water, tissues and other environmental samples for pesticides and their metabolites and degradation compounds. Included extensive work elucidating the metabolic pathways and products of a fungicide in lactating cows and chickens using radiolabeled materials.

- Analysis of multiple matrices for residues including participation in several projects leading to the registration of a fungicide for use in the US including establishment of tolerances based on work performed.
- Residue method development, resulting in an enforcement method that was subjected to an EPA method trial and subsequently accepted.
- Participated in studies elucidating the metabolic pathway and metabolic products of pesticides in lactating cows, lactating goats, chickens, rats, crops, soil and water.

Chemist (1972-1973)
National Marine Fisheries Service, Utilization Branch
Seattle, Washington

Analyzed fish and fish products for heavy metals using atomic absorption spectrophotometry. In addition served as the local sample coordinator for a national survey designed to determine the extent of heavy metal contamination in commercially important fish. This work included record keeping, sample preparation and sample shipment.

- Analyzed fish and fish protein concentrate for mercury.
- Coordinated the receipt, processing and shipping of approximately 3000 marine tissue samples for the Northwest portion of a national heavy metals sampling program.

PUBLICATIONS

Cramer, J.C., **S.O. Jacobson**, and B.D. McGaughey. 1988. Standard Operating Procedures for Handling Organophosphates in the Field and Laboratory. Society for Environmental Toxicology and Chemistry 1988 Annual Meeting Abstracts.

Numerous company-confidential reports related to the development of agrochemicals.

PRESENTATIONS

S.O. Jacobson. 1988 to 2004 Chemical Safety in the Laboratory, internal courses for Compliance Services International.

S.O. Jacobson. 1989. Toxicology of Pesticides, Northwest Christmas Tree Growers Association (Portland, Oregon).

S.O. Jacobson. 1989. Good Laboratory Practices and Quality Assurance, internal course for Agvise Laboratories (Northwood, North Dakota).

J.C. Cramer, **S.O. Jacobson** and B.D. McGaughey. 1988. Standard Operating Procedure for Handling Organophosphate Insecticides in the Field, Society of Environmental Toxicology and Chemistry (Arlington, Virginia).

S.O. Jacobson. 1988. Good Laboratory Practices and Quality Assurance, internal course for Center for Hazardous Materials Research (Pittsburgh, Pennsylvania).

S.O. Jacobson. 1987. Laboratory safety and techniques, internal course for Laucks Testing Laboratories (Seattle, Washington).

S.O. Jacobson. 1984 to 1987. Radiation Safety in the Chemical Laboratory, internal courses for Pennwalt Corporation (Tacoma, Washington).

ADDITIONAL TRAINING

- 2008 **NPIRS Database Training:** National Pesticide Information Retrieval System, Purdue University
- 2003 **Dialog Skills Review:** Dialog Corporation
- 2003 **First Aid and Adult CPR:** American Red Cross.
- 1997 **International Turbochrom Users Meeting:** PE Nelson.
- 1997 **Introduction to the FIFRA Good Laboratory Practice Standards:** Diane E. Bradway, Environmental Quality Assessment Services.
- 1997 **GLPs for Study Directors:** Diane E. Bradway, Environmental Quality Assessment Services.
- 1997 **GLPs for Management:** Diane E. Bradway, Environmental Quality Assessment Services.
- 1996 **HP 5971/5972 Series MSD Operation and Maintenance:** Hewlett-Packard.
- 1996 **Good Laboratory Practices, Analytical Laboratory Series:** Compliance Services International (Internal Course).
- 1995 **Gel Permeation Sample Clean Up Procedures:** ABC Laboratories.
- 1995 **Good Laboratory Practices, Analytical Laboratory Series:** Compliance Services International (Internal Course).
- 1994 **HPLC Post Column Derivatization Techniques:** Radian Corporation.

- 1994 **Good Laboratory Practices, Analytical Laboratory Series:** Compliance Services International (Internal Course).
- 1994 **Good Laboratory Practices, Video Instruction Course:** American Chemical Society.
- 1993 **PE Nelson Turbochrom 3 Training:** Perkin Elmer.
- 1993 **EPA Good Laboratory Practice Standards:** Garndal Associates.
- 1992 **Effective Management of Chemical Analysis Laboratories:** American Chemical Society.
- 1991 **Introduction to High Performance Liquid Chromatography:** Hewlett-Packard.
- 1990 **Hazardous Materials Management Review Course:** Lake Washington VOTECH.
- 1989 **Certified Hazardous Materials Manager:** Academy of Hazardous Materials Management.
- 1989 **Resourceful Hazardous Waste Management:** Washington State Department of Ecology.
- 1988 **Designing and Implementing Effective Groundwater Contamination Investigations:** Blasland, Bouck and Lee.
- 1988 **Hazardous Waste Management:** Renton Vocational Technical School.
- 1978 **Quantitative Thin Layer Chromatographic Techniques:** Kontes.
- 1974 **Introduction to High Performance Liquid Chromatography:** Varian Instruments.