

ACS NATIONAL MEETING, FALL 2007, BOSTON, USA

Nancy Ragsdale summarises the presentations made at the August 2007 ACS meeting.

The American Chemical Society's 234th national meeting was held in Boston August 19 – 23, 2007. There were 15,344 registrants. The Division of Agrochemicals (AGRO) sessions included a broad array of topics that embraced the division's new slogan, "Chemistry for and from Agriculture". AGRO's program featured six topic-specific symposia with oral and poster presentations, an International Award symposium, graduate student award posters, the Sterling Hendricks Award lecture, a general topic symposium with oral and poster presentations on new developments and issues in agrochemical sciences, one symposium organized by another division and cosponsored by AGRO, and one session devoted to presentations and discussions on future directions for AGRO.

Dr. Frederick J. Perlak received the International Award for Research in Agrochemicals for his work in discovery, development and commercialization of insect-protected crops. His efforts and those of his colleagues at Monsanto Company resulted in the development and introduction of Bollgard cotton in 1996, one of the first commercially successful biotechnology products that could protect itself from insect pest damage. After receiving his Ph.D. in Microbiology from the University of Massachusetts and following a post-doctoral appointment at Ohio State University, Dr. Perlak joined the Agricultural Division of Monsanto company as a research scientist focused on isolation and characterization of genes that code for proteinaceous insect toxins. He has received numerous awards in recognition of his scientific accomplishments including Monsanto Fellow and the Edgar M. Queeny Award for Science and Technology, the highest award within Monsanto for scientific achievement. In 2000, he was presented the Friend to Indian Cotton Farmer Award by the Federation of Indian Farmers for his efforts to commercialize insect-protected cotton in India. A symposium held in his honor focused on genetically modified crops and the challenges associated with them.



Dr. Bruce E. Dale received the Sterling B. Hendricks Memorial Lectureship Award, presented by Agricultural Research Service, USDA and cosponsored by AGRO jointly with the Division of Agricultural and Food Chemistry. Dr. Dale leads the Biomass Conversion Research Lab at Michigan State University (MSU), is



Associate Director of the MSU Office of Bio-based Technologies, and is a Professor of Chemical Engineering. He is internationally recognized for his work on biomass conversion and sustainability. His scientific interests lie in the environmentally sustainable conversion of plant matter to industrial products, such as fuels and chemicals, while meeting human and animal needs for food and feed. Among Dr. Dale's honors and awards are the Charles D. Scott Award for his contributions to the use of biotechnology to produce fuels, chemicals and other industrial products from renewable plant resources, the Abell Young Faculty Research Award, and the Halliburton Outstanding Young Faculty Award. His lecture was entitled "Why Cellulosic Ethanol is Nearer than you Think: Creating the Biofuels Future".



Agricultural chemistry student research was well represented at the Fall 2007 ACS meeting. Ten students received \$600 educational grants to help defray the costs of presenting their research posters at this meeting. Sixteen students representing ten universities participated in the AGRO division's student research poster symposium. The quality of the presentations was excellent, making the judging of the posters extremely difficult. However, the judges persevered in picking the top three posters:

- First Place – **Hilliary E. Hodgson**. Binary mixtures of pyrethroids crosstalk between voltage-sensitive calcium and chloride channels in isolated presynaptic nerve terminals from rat brain. H. E. Hodgson, R. K. Frisbie, J. M. Clark; University of Massachusetts, Amherst, MA.
- Second Place - **Keri L. Henderson**. Fate of sulfamethazine in surface water microcosms. K. L. Henderson, T. B. Moorman, J. R. Coats; Iowa State University, Ames, IA.
- Third Place (tie)- **Deok Ho Kwon**. Molecular cloning of sodium channel and identification of point

mutations putatively associated with fenpropathrin resistance in *Tetranychus urticae*. D. H. Kwon, B. R. Choi, S. W. Lee, H. M. Park, J. M. Clark, S. Lee; University of Massachusetts, Amherst, MA.

- Third Place (tie)- . Dhana Raj Boina Toxicity and mode of action of the anion transporter blockers against the European corn borer. D. R. Boina, J. R. Bloomquist; Virginia Tech University, Blacksburg, VA.

Students interested in participating in the 2008 AGRO student research poster competition (ACS National Meeting, August 17 – 21, 2008, Philadelphia, PA) should email john.j.johnston@aphis.usda.gov by April 1, 2008.

A symposium on agrochemical residue and metabolism included a wide variety of presentations. A number of these examined residues in animals and animal products resulting from drugs, pollutants and pesticides. An interesting study suggested the use of ruminants for bioremediation of TNT-contaminated soils (2,4,6-trinitrotoluene). Other presentations addressed the potential utility of available residue data for predictive modeling of crop protection product residues on crop commodities and for establishing priorities in monitoring imported food. Several papers covered environmental fate and associated factors of specific chemicals. Methodologies for worker pesticide exposure and water quality determination were also presented. One paper presented physiological differences between glyphosate-resistant and -susceptible horseweed (*Conyza canadensis*).

A symposium on biotechnology and environmental applications of immunochemistry clearly demonstrated the ever increasing utility of this technology. A wide variety of uses as well as method development to address newly identified needs were covered. The importance of immunoassays for rapid, simple detection and quantification of genetically engineered material in food products as well as the environment was the focus of several presentations. Additional uses discussed included immunochemical techniques to determine various naturally occurring and manmade contaminants in the environment as well as the food supply, aid in pest management programs, to assure safe levels in food of specified proteins that trigger allergic reactions in sensitive individuals, determination of ruminant protein content in ruminant feeds, and the use of immunoextraction in detection of specific explosives.

A great deal of attention has focused on volatile organic compounds (VOCs). A symposium that focused primarily on VOC contributions through the use of agricultural chemicals included presentations on determining emission quantities of various chemicals, approaches to reducing fumigant emissions from treated soils, modeling to determine exposure resulting from fumigation, and factors such as atmospheric and topographic conditions involved in evaluating VOCs. Presentations also addressed the problem that solvents, known as inert ingredients, in pesticide formulations can be VOCs. It was pointed out that product reformulations are costly endeavors for registrants and could mean increased costs to growers without meeting the goals of VOC reduction. Many presentations gave particular attention to the San Joaquin Valley, which is a farming intensive region in central California where growers depend upon crop protection products.

A symposium on current issues in IPM addressed integration of various methods of pest control, knowledge of the pest and crop, and estimating potential crop loss with consideration given in specific cases to the presence of organisms that are threatened or endangered. The advantages of biopesticides and challenges in their development were presented. One paper provided information on the academic programs at the University of Florida that prepare students for IPM careers. Another discussed the Integrated Pest Management – Pest Information Platform for Extension and Education (IPM – PIPE), which gives access through a public website to national pest incidence and distribution data, disease forecasting, and state-specific control recommendations.

The overall theme for the Boston ACS meeting was “Biotechnology for Health and Wellness.” In keeping with this theme, AGRO held a symposium on nanotechnology in agriculture. Papers addressed the many potential applications of nanotechnology coupled with the importance of carefully balancing information with uncertainties, and an examination of social and ethical dimensions of agrifood nanotechnology. Presentations addressed specific research on a plethora of topics such as biologically-inspired molecular electronics, delivery of microorganisms to aquatic ecosystems, design and synthesis of multifunctional hybrid materials, detection of protein conformational changes associated with pathogenesis, and non-invasive antimicrobial treatment of bacterial infections. Integration of nanotechnology with other analytical techniques to increase sensitivity and throughput, diagnosis and sampling to enhance food safety, potential antimicrobial and drug delivery systems, separation of bacteria from liquids, and assays for toxins and for DNA were other topics covered.

A symposium on the importance of enantioselectivity in fate and effects of modern chiral agrochemicals addressed pertinent research on specific agrochemicals as well as methodology development. Many papers emphasized that enantioselectivity in a variety of processes evaluated to determine health and environmental risks must be an important consideration not only in risk assessment but also in regulatory decisions. Implications for detrimental environmental impacts and for endocrine disruption were topics addressed in a number of papers. A frequent topic was methodology to separate and identify specific enantiomers. Papers addressing environmental fate emphasized the tremendous variations that can occur in enantioselective degradation due to a multiplicity of varying environmental factors. An overall message from this symposium was that enantiospecific differences in agrochemicals must be considered in regulatory risk assessments, but a continuing challenge is to improve the science upon which the assessments are based.

A portion of the program covered new developments and issues in agrochemical sciences that were not addressed in the various symposia. The wide variety of topics could be generally sorted into categories related to environmental impacts/remediation, enhancing plant growth through soil improvement, and new pest control materials. Presentations on new pest management agents included a new nematicide

and a variety of natural products as well as biological control agents acting as herbicides, fungicides, insecticides or plant growth regulators.

AGRO also cosponsored a symposium organized by the Division of Fuel Chemistry on biofuels. These presentations included research on a number of agricultural commodities and by-products such as canola/rapeseed oil, waste fryer grease, soapstock feedstocks, soybean oil, and poultry fat. Many papers addressed approaches to improve the economics of biofuel production.

AGRO closed their program with presentations and discussions on the past, present and future of the division.

This has been a banner year for the AGRO division; an all time high (383) number of technical presentations were made at AGRO symposia in 2007. AGRO is moving into a trial phase for the next two years during which the division will only meet with the ACS national meeting once a year. To increase opportunities for its membership, AGRO is planning several interdisciplinary symposia with other scientific organizations including the Society of Environmental Toxicology and Chemistry (SETAC) and the Pesticide Society of Japan. Thus the next AGRO meeting held in conjunction with an ACS national meeting will be August 17 – 21, 2008 in Philadelphia.