



ACS 2022 Chicago

AGRO Programming



Call for Papers

Notes from the Program Chair

Heidi Irrig

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The AGRO program at the 264th National ACS Meeting and Exposition in Chicago, Illinois will be a hybrid meeting held August 21 – 25, 2022, and the theme is ***Sustainability in a Changing World***. The program is taking shape, as we have accepted over 20 proposed symposia organized by about 60 scientists representing academia, government, and private sectors. I thank all our dedicated and enthusiastic symposia organizers for their expertise, time, and effort in leading this delightful scientific exchange. If you would like to present your work in a symposium, please note abstract submission is January 10 – March 14, 2022.

AGRO has embraced change these past two years, meeting differently and approaching new ways of sharing cutting edge research, ideas and connecting like we never envisioned. Flexibility has become the norm for our Fall national meetings. We have adapted quickly to the new formats for meetings and the AGRO Fall 2022 meeting will continue to be a brand-new way of getting together. The Fall 2022 meeting will not be like our previous live meetings nor our recent zoom meetings; it will be a hybrid of both.

AGRO Fall 2022 Meeting - What you need to know. While ACS cannot predict the future and know for certain what the Fall meeting will be like, we can look to the Spring 2022 meeting in San Diego and share this meeting's ways of participating as a guide to the Fall meeting. Please see the ACS Spring National Meeting Ways of Meeting for further details.

<https://www.acs.org/content/acs/en/meetings/acs-meetings/registration/why-attend.html>

Key points as of this writing.

- When speakers submit their abstracts, they will have to indicate whether they will be presenting in-person or virtually. There will be a date given that will allow them to change their presenting status if needed.
- Organizers will have to plan their sessions taking into consideration the speaker's preference (in-person or virtual).
- Each symposium will have all types of sessions available.
- Organizers will need to group similar types of presentations together: all in-person together, all virtual together.
- All presentations will be live unless a pre-recorded presentation is arranged in advance.
- In-person attendance will require proof of vaccination.

Four Ways to Participate in the Meeting. There will be four types of sessions: in-person, hybrid, virtual and on-demand.

- ***In-person*** – Typical pre-Covid, all speakers in a room giving their talks with no internet available. Presenters will present and participate in-person or, in some cases, provide a pre-recorded video to be played in the room with no opportunity for live Q&A interaction. Attendees participate in-person with live Q&A.
- ***Virtual Only*** – Zoom meeting like the past 2 years. All presenters and attendees participate 100% live virtually via the meeting platform, or with presenters via providing a pre-recorded video to be played during the session.
- ***Hybrid room*** – Presenters may give their presentations in Chicago or elsewhere virtually, but both will be live. Hybrid rooms will have access to internet. People can ask questions live. These sessions will be live streamed from Chicago.

Presenters and attendees may participate in-person in Chicago or virtually via the meeting platform, or in some cases, presenters may provide a pre-recorded video to be played during the session.

- ***On-Demand presentation*** – All presenters have the option of uploading a recorded presentation for on-line view for 2 weeks after the meeting. Presentations uploaded for on-demand access will be available to view within 24 hours after the live presentation time. On-demand presentations will then remain available for registrants for two-weeks after the end-of the meeting.

The Frequently Asked Questions on the ACS website (<https://www.acs.org/content/acs/en/meetings/acs-meetings/registration/faq.html>) continues to be a great resource for the many questions presenters and presiders have during these strange and unpredictable times!

Awards. While in Chicago, we will recognize the significant achievements of our colleagues in agrochemical research. **Jeffrey Scott** will be awarded the ACS International Award for Research in Agrochemicals in a symposium organized by John Clark and Ke Dong. **Joel Coats** will receive 2022 AGRO Innovation Award. The Sterling Hendricks Memorial Lectureship will be hosted by AGRO Division, co-sponsored by AGFD, and will feature **Stephen Duke**. The Journal of Agricultural and Food Chemistry Best Paper Awards will be announced in early spring.

Early Career Opportunities. ***AGRO Education Awards*** for Student Travel provides funding for students who present their poster at National ACS meeting. The deadline for applications is March 14, 2022. This award will defray costs associated with the meeting up to \$1,000 for a limited number of students. Thank you to Aaron Gross and Sara Whiting for co-chairing this award.

AGRO New Investigator Award (NIA) recognizes scientists who have obtained doctoral degree in last five years and have produced significant accomplishments conducting research, consulting, or regulatory studies. Full application packages are due by March 14, 2022. Thank you to Sasha Kveskin for organizing this award program.

Early Career Symposia Series provides funds for symposia within the AGRO program that are organized by and feature speakers within 10 years of highest degree earned. In Fall 2022, we are delighted to welcome two Early Career Symposia to our Program: *Deciphering plant-insect-microorganism signals for sustainable crop production* organized (Nurhayat Tabanca, Gareth Thomas) and *Sustainability in Environmental Fate and Behavior* (Aleksandra Dean, Samantha Nedder, Xavier Poole).

AGRO Programming Support. Finally, we continue to rely on the expertise of Peney Patton (ppatton@agrodiv.org), Program Secretariat for AGRO and ENVR. Thank you, Peney, for all your help during this 2021-2022 planning cycle! <3

***** PLEASE NOTE *****

All abstracts must be 2500 characters or less and must be submitted on-line

<http://maps.acs.org>

DEADLINE: March 14, 2022

THERE WILL BE NO EXTENSIONS



List of AGRO Symposia by Topic Area
260th ACS National Meeting and Exposition
August 21 – 25, 2022, Chicago, Illinois USA and Online
Sustainability in a Changing World

Each year, in addition to our traditional award/tribute symposia, the AGRO Division programs specific symposia in most, but not all, of our standing programming areas. Presentations for those standing program areas not included in listed symposia will be grouped in AGRO's general poster session.

Agrochemical Residue, Analytical and Metabolism Chemistry, and Metabolomics

- Uses of HPLC-Mass Spectrometry in Support of Agricultural Research and Development – New Trends and Best Practices
- Extraction Efficiency Testing for Residue Analytical Methods: Study Designs, Guideline Requirements, Trends, and Challenges

Agrochemical Toxicology and Mode of Action

- 2022 ACS International Award for Research in Agrochemicals: The Many Faces of Insecticide Toxicology: Resistance, Mode of Action, New Insecticides and Novel Control Strategies
- INsecticides and TARgets (INSTAR) Summit

Air Quality and Agriculture

- Pesticide Drift and Volatility: Is the Answer Blowin' in the Wind?

Biorationale Pesticides, Natural Products, Pheromones, and Chemical Signaling in Agriculture

- Deciphering plant-insect-microorganism signals for sustainable crop production. **Early Career Scientist Symposium**

Communication

- Sustainable Agriculture – A Promise for the Future

Developments in Integrated Pest Management and Resistance Management

- INsecticides and TARgets (INSTAR) Summit

Discovery and Synthesis of Bioactive Compounds

- Bioisoteric Replacement and Scaffold hopping for Bioactive Compound Discovery

Ecosystem Exposure and Ecological Risk Assessment

- Upfront Mitigation: What that Means in the FIFRA/ESA Consultation Process

Environmental Fate, Transport, and Modeling of Agriculturally-related Chemicals

- Study Designs, Data Interpretation, and Regulatory Acceptance of Terrestrial Field Dissipation Studies Conducted under OECD Guidance
- Environmental Fate, Transport, and Modeling of Agriculturally-related Chemicals
- Impact of Climate Change on Agriculture and Food Security
- Sustainability in Environmental Fate and Behavior: **Early Career Scientist Symposium**

Formulations, Process Chemistry, and Application Technology

- Enhanced Formulations and Delivery Systems through Surfactant and Colloid Technology
- Unmanned Aerial Systems (aka Drones) Pesticides Spraying and other Agricultural Applications

Human and Animal Health Protection: Vector Control, Veterinary Pharmaceutical, Antimicrobial, and Worker Protection Products

- Advances in the Control of Medical, Agricultural, and Veterinary Disease Vectors

Human Exposure, Health, and Risk Management

- Human Health Paradigms: Exposure, Risk Assessment, and Policies for Agrochemicals

Pesticides, Pollinators, and Non-target Arthropods

- Nontarget Arthropod Risk Assessment Scientific Developments, Challenges, and Research Needs
- Pollinator Risk Assessment Modelling, Methods, and Research

Technological Advances and Applications in Ag Science

- New Crop Yield Technology Companies Improving Sustainability

Special Topics and General Symposium

- Protection of Agricultural Productivity, Public Health, and the Environment (General Session)

Awards Co-sponsored with AGFD and Others

- USDA-ARS Sterling B. Hendricks Memorial Lectureship Award
- ACS Kansas City Division Kenneth A. Spencer Award
- Journal of Agriculture and Food Chemistry Article Award



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264th ACS National Meeting & Exposition

August 21 – 25, 2022

Chicago, Illinois USA

2022 ACS International Award for Research in Agrochemicals

The Many Faces of Insecticide Toxicology:

Resistance, Mode of Action, New Insecticides, and Novel Control Strategies

Purpose of Symposium

This symposium is in honor of Dr. Jeffrey Scott, recipient of the 2022 International Award for Research in Agrochemicals.

The symposium will interest chemists, biochemists, and biologists working in academia, industry and the public health sector involved in crop protection, animal health, and the control of insect vectors of human disease. Advances in functional genomics have enhanced our understanding of insecticide resistance, the molecular basis of insecticide action and insecticide selectivity. Proteomic approaches show great potential for augmenting the results of genomic analyses and expanding our understanding of how insects respond to insecticides. New technologies (such as CRISPR) have allowed for high resolution manipulation of genes to understand how genetic changes impact phenotypes, such as sensitivity to toxins.

Faced with the challenge of continuing population growth, there are increased needs for feeding humanity and protecting people from vector borne diseases. Sustainable pest control requires innovative techniques to understand and slow the evolution of resistance, plus the development of new insecticides and novel control strategies.

Suggested Topics

- Evolution, genetics, genomics and mechanisms of insecticide resistance
- Interaction of insecticides with target sites
- The genes coding for enzymes involved in insecticide metabolism and their regulation
- Novel methods of insect control
- New insecticides for insect control
- Repellents for the control of pests and insect vectors
- Insecticide resistance management
- Insecticide toxicology and physiology

For further information, contact the organizers

John Clark, University of Massachusetts-Amherst, 413-545-1052, jclark@vasci.umass.edu

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January 10 – March 14, 2022



Call for Papers

264th ACS National Meeting & Exposition

August 21 – 25, 2022

Chicago, Illinois USA

Advances in the Control of Medical, Agricultural, and Veterinary Disease Vectors

Purpose of Symposium

Chemical insecticides remain one of the most effective tools in combatting vectors of medical, agricultural, and veterinary disease; however, their efficacy is limited when insects develop physiological and biochemical mechanisms of resistance. Therefore, new tools are needed to control these disease vectors and deploy novel chemistries in numerous environments.

This ACS-sponsored symposium series will highlight advances in the field of vector control, specifically vectors of medical, veterinary, and agricultural diseases. Contributors will discuss the importance of characterizing novel biochemical targets, the development of novel insecticides/repellents/synergists, and the implementation of novel pest control paradigms that have the potential to overcome insecticide-resistant populations in diverse environments.

The goal of this symposium is to bring together scientists with diverse research programs to bolster collaboration and future research projects. This symposium welcomes participants from other ACS divisions, including ANYL, BIOT, ENVR, and MEDI.

Suggested Topics

- Mosquito and tick control
- Veterinary pest control
- Agricultural disease vectors
- Biorational chemistry
- Biochemical targets of new insecticides
- Repurposing insecticides for new pests
- Circumventing insecticide resistance
- Insect-host interactions and repellents

For further information, contact the organizers

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Aaron D. Gross, Virginia Polytechnic Institute and State University, 540-232-8448, adgross@vt.edu

Daniel Swale, Louisiana State University, 225-578-1832, dswale@agcenter.lsu.edu

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Call for Papers

264th ACS National Meeting & Exposition

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Bioisosteric Replacement and Scaffold Hopping for Bioactive Compound Discovery

Purpose of Symposium

The discovery and development of new agrochemicals has become a difficult and resource-intensive undertaking. In recent years, research approaches based on bioisosteric replacements and scaffold hopping have proven to be a very successful strategy to inventing new environmentally-friendly crop protection products.

This symposium is designed to highlight the importance of bioisosterism and scaffold hopping in modern crop protection research and to showcase recent examples of rational design approaches. Furthermore, this symposium provides a platform to discuss the latest trends and challenges in the field of bioisosterism and offers a unique platform for networking.

Other ACS divisions such as the MEDI, ENVR, and TOXI may benefit from this symposium.

Suggested Topics

- New innovations resulting from bioisosteric replacement and scaffold hopping
- Applications of bioisosteres in the design of novel pesticides
- Improvement of biological or product safety properties based on the use of classical and non-classical bioisosteres
- Bioisosteric replacements and scaffold hopping based on computational methods and computer-aided drug design
- Scope and limitations of bioisosterism and scaffold hopping
- Newest trends in the design of bioactive compounds

For further information, contact the organizers

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Call for Papers

ACS National Meeting & Exposition

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Deciphering Plant-Insect-Microorganism Signals for Sustainable Crop Production: Early Career Symposium

Purpose of Symposium

Chemical signals, or semiochemicals, are produced by organisms including plants, insects, and microorganisms, which enable them to communicate intra- and inter-specifically. These semiochemicals can be exploited to benefit crops, through mechanisms including, but not limited to, direct protection of crops against pests, stimulation of crop growth, and signaling to beneficial predators for the control of pests. Identifying these semiochemicals, and developing an understanding of their biological activities, can enable the development of novel, sustainable tools to increase crop productivity, which can help to address the growing need to provide sufficient food for a growing population.

This early career symposium is focused towards graduate students, post-doctoral researchers, research technicians, research fellows, and other early career researchers across academia, industry, and government with research interests relating to chemical ecology. The aim of the symposium is to provide a platform for early career scientists to gain experience presenting their research, as well as to learn about cutting edge technologies used across other laboratories studying plant-insect-microbe chemical signaling. This can provide a way for them to build international networks and develop collaborations to address future challenges facing food security. The symposium welcomes participants from other ACS divisions, including AGFD, ANYL, BIOT, and ENVR.

Suggested Topics

- Analytical tools to identify novel semiochemicals, including, but not limited to, GC, GC-MS, GC-electroantennography (GC-EAG), and HPLC
- Collection techniques for volatile organic compounds, including dynamic headspace collections and solid phase microextraction (SPME).
- Chemically mediated interactions between plants, insects, and microbes
- Application of semiochemical-based lures for the management and control of pests from lab to field
- Isolation and synthesis of semiochemicals
- Commercialization of semiochemicals for crop protection, from an industry perspective
- Regulation of semiochemicals as crop protection tools, from a government perspective

For further information, contact the organizers

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Gareth Thomas, Rothamsted Research, UK, gareth.thomas@rothamsted.ac.uk

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***Enhanced Formulations and Delivery Systems
Through Surfactant and Colloid Technology***

Purpose of Symposium

This symposium covers industry, government, and academic advances on formulations and application technologies through applied surface and colloidal chemistry. The target audience for this symposium includes scientists applying surfactant and colloid science amenable across industries to develop beneficial and improved formulations and application methods.

Participants in this symposium will have the opportunity to gain insights into the challenges of formulation science of traditional small molecule chemistry (pharma, crop protection, paints, inks, petrochemical) as well as newer microbial and biological solutions for new end-user experiences. This symposium may be of interest to AGRO, AGFD, and COLL Divisions.

Suggested Topics

- Formulating complex multi-active ingredient products, including biologicals
- Advances in additives and adjuvants to improve performance or mitigate adverse effects of actives, including microbial and biological
- Advances in delivery system technology attributable to individual products (e.g., nanotechnology, encapsulation, controlled release)
- Formulations that enable traditional small molecule and biological mixtures
- Management of undesired effects through formulation's physical-chemical properties
- Formulating to optimize coating treatment processing/performance (e.g., paints, seeds treatment, powder/liquid coatings)
- Precision and customized delivery (e.g., sensor development, real time monitoring of applications, variable rate application, and drone applications)

For further information, contact the organizers

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Chicago, Illinois USA

Environmental Fate, Transport, and Modeling of Agriculturally-related Chemicals and Pollutants

Purpose of Symposium

Effective risk assessment and risk characterization of pesticides requires detailed measurement and prediction of their environmental fate and distribution in target use regions. This symposium will improve knowledge and identify research needs on this critically important topic. Results are expected to improve the accuracy and confidence in pesticide exposure/risk assessments and in the process, facilitate harmonization of pesticide registration globally. Spatial and temporal differences, fate process coupling and interaction, conservation practice implementation, and changing climates may add substantial variability to pesticide fate assessments.

Presentations describing original research, cases studies, and literature review which address these and related topics are encouraged. Scientists and regulators engaged in all aspects of pesticide exposure assessment, modeling, and fate evaluation will benefit by active participation. Other ACS Divisions that may benefit from attending and participating in this symposium are ANYL, ENVR, and AGFD.

Suggested Topics

- Relating laboratory and field fate measurements
- Conduct and interpretation of environmental monitoring
- Regulatory relevance of modeling, monitoring, and environmental fate measurements
- Advances in modeling of the environment
- Policy implications of modeling, monitoring, or environmental fate
- Improving model accuracy
- Establishing model calibration and validation criteria
- Coupling fate processes and models
- Novel laboratory or field fate study designs
- Characterizing the fate of biopesticides

For further information, contact the organizers

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***Extraction Efficiency testing for Residue Analytical Methods:
Study Designs, Guideline requirements, Trends and Challenges***

Purpose of Symposium

The guideline requirements of analytical method for residue analysis are becoming more and more challenging. The analytes included in the residue analytical method from the analysis are mainly derived from ¹⁴C metabolism studies. However, a key element for any residue analytical method is an extraction procedure which can adequately extract all bioavailable and relevant residues found in the ¹⁴C metabolism studies. Consequently, the evaluation of extraction efficiency is extremely important in plant, animal, and soil residue analytical methods that are used for data generation (risk assessments, MRL establishments) and post registrations monitoring purposes (enforcement). Data must be provided as a proof of adequate extraction of residues that are included in the residue definition for risk assessment and enforcements.

This symposium will also generate communication about recent guidelines and approaches to develop methods focusing on extraction efficiency. The symposium will encourage discussion about the different approaches to conduct extractability assessments. Other ACS divisions that may benefit from this symposium are ANYL, ENVR, and AGFD.

Suggested Topics

- Extraction efficiency testing designs to comply with the extraction procedures used in metabolism studies
- Streamlining method development (crop grouping approaches, application of new technologies) using global guidelines (i.e., SANTE)
- Extractability testing using non-radiolabeled incurred field samples and reference substance
- Challenging analytical methods with unusual matrices (i.e., hops) or lower abundance of analytes
- Extractability of unusual analytes (e.g., ionic compounds) in single residue method
- Developing extraction efficiency testing with multiplexed methods: more analytes, more matrices
- Extraction efficiency testing for multi-residue methods (i.e., using CEN QuEChERS, AOAC, S19, etc.) meeting global requirements

For further information, contact the organizers

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Call for Papers

264th ACS National Meeting & Exposition

August 21 – 25, 2022

Chicago, Illinois USA

Good Laboratory Practices for the Agrochemical Professional

Purpose of Symposium

Good Laboratory Practices (GLPs) regulations set requirements for how studies supporting pesticide research and marketing permits are planned, conducted, reported, and archived. These requirements help assure regulatory agencies that the data submitted are a true reflection of the results obtained during the study and can therefore be relied upon when making risk or safety assessments.

The purpose of this symposium is to educate agrochemical professionals on GLP requirements and best practices, including protocol development, study conduct and field trials, Quality Assurance Unit (QAU) phase inspections, data management, and reporting. The target audience includes anyone who works on GLP studies, quality assurance professionals, and those new to the GLP environment.

This symposium will be held in conjunction with the EPA-GLP Specialty Section of the Society of Quality Assurance (SQA)

Suggested Topics

- GLP basics
- Standard Operating Procedure management
- Equipment maintenance and record keeping
- Efficient record keeping
- QAU Inspections: What to expect
- Data handling
- Preparation of final reports
- Effective management of multi-site studies

For further information, contact the organizers

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August 21 – 25, 2022
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***Human Health Paradigms:
Exposure, Risk Assessment, and Policies for Agrochemicals***

Purpose of Symposium

The purpose of the symposium is to promote discussion of evolving and/or proposed regulatory policies and their emerging impact on human health risk assessments for agrochemicals. Submissions which focus on methods for exposure and risk assessment as well as policy perspectives are sought.

Exposure measurements and risk assessment models to ensure consumer, worker and bystander safety are an integral part of regulatory process for active ingredient product approval. Advances in measurements, models, and regulation will be discussed. Discussions of U.S. and global approaches are welcomed.

Presentations describing original research, cases studies, literature reviews, or policies which address these, and related, topics are encouraged. Scientists and regulators engaged in all aspects of pesticide exposure and risk assessment, monitoring and computational modeling, and regulation will benefit by active participation. Members of AGFD and TOXI Divisions may also be interested.

Suggested Topics

- Consumption, residues, and/or monitoring for dietary assessment
- Residue definition approaches
- Drinking water models for human consumption
- Aggregate and residential exposure considerations
- Worker exposure models and policies
- Cumulative assessment refinements: options and priorities
- Advances in inhalation measurements and models
- Biomonitoring and epidemiology approaches
- Pbpk modelling
- Hazard identification and characterization (e.g., endocrine disruption, neurotoxicity, and carcinogenicity)
- Use of NAMS for regulation
- Optimization of animal testing
- Risk assessment vs cut-off criteria
- Mode of action or adverse outcome pathway
- 21st century programs for toxicology or risk
- How does sustainability fit with human health regulations?

For further information, contact the organizers

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Call for Papers

264th ACS National Meeting & Exposition

August 21 – 25, 2022

Chicago, Illinois USA

Impact of Climate Change on Agriculture and Food Security

Purpose of Symposium

Climate change will affect crop production through changes in temperature, precipitation, pest pressure, extreme events, trade competition, and regulation, and carbon incentives, prompting questions. What trends are historically evident and projected? What adaptation practices are available for agronomic and specialty crop production systems? How are cultural practices, production regions, and pest control practices adapting? What barriers exist to these adaptations? What impacts will cultural practices used to sequester carbon in crop production have? From a regulatory perspective, how will the responses of crop production to climate change affect the models currently used to predict pesticide risk assessment, environment fate, and runoff?

This symposium will provide a forum for participants to address these and related questions, from a high-level overview to detailed analysis. Subtopics for presentations include: (a) climate change effects on crop protection and climate change and (b) food safety, (c) pesticide environmental fate and risk assessment, and (d) carbon sequestration in crop production. The symposium is intended to generate discussion and ideas for next steps and set the stage for future symposia. This symposium may be of interest to the ACS divisions AGFD, CELL, ENFL, ENVR, and TOXI.

Suggested Topics

- Impacts on crop distribution: historical trends and projections
- Evolution and adaptations of agronomic and specialty crop system
- Evolution and changes in pest complexes and geographic ranges
- Changes in pest control practices and pesticide use, including market response
- Impacts on pesticides in the environment including leaching, runoff, erosion, and degradation
- Risks to beneficial insects and endangered species from climate change and associated adaptation practices
- Impacts on soil, air, and water quality
- Adapting models for pesticide environmental risk assessments
- Impact of carbon sequestration practices in crop production on pests, pesticide use, and the environment

For further information, contact the organizers

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INsecticide TARgets (INSTAR) Summit

Purpose of Symposium

The INSTAR (INsecticide TARgets) group was formed in 2016 as a workshop to facilitate expert discussions on issues associated with the development of new insecticides along with the successes and failures of current resistance management strategies. The purpose of the Summit is to provide a venue where academic, industry and government scientists can freely discuss advances in the field and exchange ideas fostering mutually beneficial collaborations.

The goal of the Summit is to build comradery and working relationships to facilitate the discovery of new targets, new chemistry, new products, and resistance management approaches to provide sustainable pest and vector control.

For 2022, the primary theme will be focused on similarities between herbicidal and insecticidal chemistries, target sites, and resistance mechanisms with the goal of identifying novel approaches to enhance each respective field. The Summit will have invited oral presentations, discussion sections, and an aligned poster session. Selected posters will be included. The symposium welcomes participants from other ACS divisions, including AGFD, ANYL, BIOT and ENVR.

Suggested Topics

- Similarities and differences of herbicidal and insecticidal chemistry and molecular targets
- Barriers to enhancing pesticide development
- Status of herbicide and insecticide resistance management
- Novel approaches to mitigation of pesticide resistance
- Partnership across academic, industry, and government sectors to enhance pesticide development

For further information, contact the organizers

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New Crop Yield Technology Companies Improving Sustainability

Purpose of Symposium

This symposium will introduce new, promising agriculturally related companies involved in crop yield enhancement, to a broad audience of chemists, biotechnologists, regulators and policymakers. The emphasis will be on emerging organizations with investment potential, as opposed to core ongoing research/development activities in large established agricultural companies. This will span crop protection, novel means of improving plant nutrition and novel use of computational, chemical, biological and biotech tools to improve crop yields and sustainability.

The symposium aspires to broaden audience perspectives regarding *what is possible* in competitive agricultural markets using technology and judicious business assessments and provide options for employment and engagement for a broad career range of personnel. As some of these technologies emerge, new modes of integration with agronomic practices such as traditional pesticide application or use of GMO crop seeds will need to occur, and this may imply new regulatory paradigms as well. These emerging organizations could impact both domestic and international agriculture. Members of AGFD ANYL, BIOT, and ENVR Divisions may also be interested in participating in this symposium.

Suggested Topics

- Novel pesticidal active ingredients, such as peptides, nucleic acids, enzymes, natural products, microbes, etc.
- Integration of new molecular biology technologies to improve crop yields
- Novel technologies to improve plant nutrition beyond traditional fertilizers
- Opportunities and challenges in launching startups in crop yield enhancement
- Open innovation efforts in large agricultural companies
- The changing nature of partnerships and collaboration to launch new technical initiatives- private sector, government agencies, and funding organizations
- Employment opportunities in this changing world, especially for earlier career people
- How technical innovation meets regulation
- Overcoming current food trade hurdles with new crop technologies

For further information, contact the organizers

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***Nontarget Arthropod Risk Assessment:
Scientific Developments, Challenges, and Research Needs***

Purpose of Symposium

Although pesticide risk assessment schemes throughout the world have been modified over the past decade to quantify risk to bees, such schemes for other (non-bee) non-target terrestrial arthropods (NTA) have not been revised in decades or are sparingly used. Recent research indicates that multiple stressors (*e.g.*, habitat loss, disease/pathogens, climate change, pesticides) have been associated with reported declines in both bee and NTA diversity and abundance.

The purpose of this session is to bring together science and policy experts from academia, regulatory, and industry involved in pesticide ecological risk assessment to survey new approach methods for assessing NTA exposure and effects, methods for NTA risk assessment, and approaches to address critical research needs. Important science-policy issues include balancing the need for more toxicity data with concurrent goals for reducing and refining animal testing toward greater reliance on *in vitro* / *in silico* testing schemes to inform regulatory decisions regarding pesticides.

Additional complexities for the exposure assessment for NTAs come from the need to encompass a wide variety of agronomic practices and applications, including newly developed techniques. Moreover, the diversity of the landscape and field margins result in further challenges for developing exposure scenarios. The symposium welcomes attendance and participation from other ACS Divisions, including AGFD, ANYL, BIOL, ENVR, and TOXI.

Suggested Topics

- NTA interspecies toxicity extrapolation
- Selection of surrogate test species
- NTA exposure and dosimetry estimation
- Multi-stressor interactions and assessment affecting NTA
- Spatially explicit and landscape-scale assessment of NTA
- NTA population and community-level assessment and modeling
- Challenges in performing and evaluating NTA field studies
- Integration of laboratory and field-level data in risk assessment
- *In silico* and *in vitro* testing methods
- Toxicity testing methods
- Link between pesticide use, arthropod abundance and diversity, and protection goals

For further information, contact the organizers

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Pesticide Drift and Volatility: Is the Answer Blowin' in the Wind?

Purpose of Symposium

Minimizing or even preventing the effects of pesticides on non-target areas from drift and/or volatilization has been the subject of research within the crop protection industry, government agencies, and universities for years. Growers; regulatory agencies; environmental groups; the media; and the public are also concerned with this issue. Research has focused on characterizing and quantifying pesticide drift and volatility and its underlying causes or on technologies to reduce or eliminate drift and volatilization and their effects.

Although injury to non-target crops from herbicide applications has received the most attention, the impact to non-target areas from other classes of pesticides, while less noticeable, may be no less important. The purpose of this symposium is to discuss current research including refinements in understanding the underlying causes, solutions such as management and mitigation technologies, directions for future research, and perspectives from regulatory agencies.

Other ACS Divisions that may be interested are ANYL, ENVR, AGFD, and TOXI.

Suggested Topics

- Methods and techniques to measure off-site movement of pesticides
- Development of management and mitigation tools
- Effect of new application technologies on drift and volatility
- Comparison of drift potential from various application systems
- Regulatory agency perspectives

For further information, contact the organizers

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Pollinator Risk Assessment Modelling, Methods, and Research

Purpose of Symposium

Pollinator risk assessment is an important component of the evidence-based approach used by regulatory authorities to inform decisions related to registration and re-registration of pesticides. However, the quantitative analysis has been limited by the complexity of pollinator biology, host plant interactions, and multiple factors influencing insect pollinator health and survival.

This symposium considers the theoretical and practical state of the art in pollinator risk assessment, including the use of empirical data and quantitative modeling.

The symposium welcomes participants from other ACS divisions, including AGFD, ANYL, BIOT, and ENVR.

Suggested Topics

- Advancing new approach methodologies for assessing pollinator exposure to and effects from pesticide exposure.
- Utilizing weight-of-evidence in evaluating lines of evidence.
- Challenges and opportunities in modeling colony-level effects with honey bees and non-*Apis* bees.

For further information, contact the organizers

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Protection of Agricultural Productivity, Public Health, and the Environment (General Session)

Purpose of Symposium

The AGRO Division currently has programs in a number of topic areas, but not all topics are developed into a technical symposium at every meeting.

The General Session therefore allows our members and other scientists to submit papers even though a specific symposium topic is not offered.

This year, only poster presentations are possible; every attempt will be made to group papers into “mini-symposia” within this session.

Suggested Topics

- Agricultural Biotechnology
- Agrochemical Residue, Analytical and Metabolism Chemistry, and Metabolomics
- Agrochemical Toxicology and Mode of Action
- Air Quality and Agriculture
- Biorational Pesticides, Natural Products, Pheromones, and Chemical Signaling in Agriculture
- Communication
- Developments in Integrated Pest Management and Resistance Management
- Discovery and Synthesis of Bioactive Compounds
- Ecosystem Exposure and Ecological Risk Assessment
- Environmental Fate, Transport, and Modeling of Agriculturally-related Chemicals
- Formulations and Application Technology
- Human and Animal Health Protection: Vector Control, Veterinary Pharmaceutical, Antimicrobial and Worker Protection Products
- Human Exposure, Health, and Risk Assessment
- Impact of Climate Change on Agriculture and Food Security
- Non-Food/Feed Production and Uses of Ag Commodities and Byproducts
- Pesticides, Pollinators, and Non-target Arthropods
- Regulations, Harmonization, and MRLs
- Technological Advances and Applications in Agricultural Science (e.g., Nanotechnology, Genetically-modified Organisms, and Biocontrol Agents)

For further information, contact the organizer

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Study Designs, Data Interpretation, and Regulatory Acceptance of Terrestrial Field Dissipation Studies Conducted under OECD Guidance

Purpose of Symposium

Global regulatory guidance for the conduct of terrestrial field dissipation (TFD) studies has evolved over the last 15 years. The need to generate fit-for-purpose studies has increased. This symposium will focus on TFD studies conducted in accordance with the Organization for Economic Co-operation and Development (OECD) international guidance.

This symposium seeks to bring together international stakeholders involved in the conduct and/or evaluation of TFD studies. Novel study designs, optimized application and sampling approaches, result observations, and data interpretation and utility from TFD studies conducted under the harmonized OECD guidance will be presented. The symposium organizers invite individuals to offer papers and/or posters for consideration under the suggested topics.

Other ACS Divisions that might be interested in participating in this symposium are AGFD, ANYL, and ENVR.

Suggested Topics

- Novel study designs, e.g., studies conducted outside of North America and Europe
- Site selection considerations
- Approaches to optimize application system set up and recovery of analyte(s) from soil
- Observations and trends in bare-soil and cropped plot studies
- Hydrology assessments or other approaches to evaluate water balance
- Current approaches for soil profile data collection
- Approaches and tools to define and compare ecoregions/site conditions in North America, Europe, and beyond
- Kinetics assessments performed on TFD study data
- Use of TFD data in groundwater modeling, environmental exposure, and/or risk characterization

For further information, contact the organizers

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Sustainability in Environmental Fate and Behavior: Early Career Scientist Symposium

Purpose of Symposium

Sustainability has been at the forefront of scientific discussion in recent years. The results of environmental fate studies have become more scrutinized during the registration of pesticides and pharmaceuticals. To discuss decision-making on transport and fate adequately, it is helpful to look at how industry and academia have paid attention to the concerns of the environment to ensure minimal impact of products and processes to the ecosystems. Sound data are essential to decision-making regarding sustainability. Dependable testing and assessment methods that are reliable and reproducible are essential to obtaining this sound data.

The purpose of this symposium is to share and to discuss the results of environmental fate and behavior studies, developments in analytical techniques, and assessment methods that provide more accurate data while promoting sustainability. This symposium aims to provide a forum for industry professionals, academic researchers, and regulatory officials to share innovative approaches from academia and CROs to promote collaboration.

Suggested Topics

- Innovative techniques that support regulator-required studies
- Identification of chiral stereoisomers: critical issues and regulatory compliance
- Progress of practical execution of further characterization of non-extractable residues following EPA guidance
- Kinetic evaluation of metabolites: modeling software and approaches
- Electronic data capture to promote environmental sustainability
- Statistical approaches of data following regulatory guidance
- Cutting-edge technology in research to improve efficiency while reducing hazardous waste generation
- Challenges with registration while evaluating the toxicity, persistence, and ecological effects
- Parallels and differences across guidance documents

For further information, contact the organizers

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Sustainable Agriculture - A Promise for the Future

Purpose of Symposium

Sustainable agriculture refers to responsible farming that meets the present and future needs of our society, with particular emphasis on protecting our environment, the health of farmers and consumers, and the use of new agricultural practices that considers the needs of future generations.

This symposium will discuss the paradigm shifts in research and development needed to develop new sustainable solutions, as well as the changing regulatory landscape and new agricultural practices required to meet the challenges of sustainability in agriculture.

We invite researchers, scientists, and managers interested in sustainability and agriculture to participate in this symposium. This symposium is open for collaboration with other divisions such as ENVR.

Suggested Topics

- Sustainability – What does it mean to you and your organization?
- What paradigm changes in R&D are required to deliver sustainable products?
- How to find new leads, starting points and technologies for sustainable crop protection?
- Sustainability – From molecule identification to development compounds and green chemistry concepts
- Academic / industrial partnerships
- Green manufacturing – Where are we and how far can we go?
- New farming practices, precision, and digital agriculture addressing the global sustainability challenges
- Latest trends in product stewardship, product life cycle management, regulatory framework, PFAS strategy, soil health, etc., to achieve the goal of sustainable crop protection

For further information, contact the organizers

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Unmanned Aerial Systems (aka Drones): Pesticide Spraying and Other Agricultural Applications

Purpose of Symposium

This symposium is intended to facilitate dialogue among scientists in agriculture-related fields to examine the opportunities and challenges in technical and regulatory areas associated with the use of unmanned aerial systems (UASs, aka drones) in agriculture. Presentations related to pesticide spraying or spreading, pollination, field scouting, and related topics are encouraged.

The symposium will provide a forum for interactions and exchange of latest development among academic, industry, and government experts. It will enhance understanding of UAS spraying and related activities that may have implications for agriculture and related industries, public interest, and the environment, as well as stimulating progress toward developing this new technology on a sustainable path. This symposium may be of interest to other ACS divisions such as ENVR and ANYL.

Suggested Topics

- Development of UAS technology for use in agriculture, public health, industrial vegetative management including integration of a spraying module into UAS design
- UAS spraying – evaluation of in-field performance, off-target spray drift, operator exposure, etc.
- Scouting and remote sensing facilitated by UASs
- Unconventional uses of UASs in agriculture (e.g., pollination, non-liquid applications, etc.)
- Evaluation of different UAS design factors affecting performance in the field
- Model development for evaluating UAS performance for off-target exposure and risk assessment
- Regulatory aspects, including permitting, labeling, consideration of drift-reducing technology, and best management practices
- Addressing challenges associated with payload/power constraints and ultra-low volume spraying
- Socio-economic factors, including challenges and opportunities (e.g., labor, public support, etc.)

For further information, contact the organizers

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Upfront Mitigation: What that Means in the FIFRA/ESA Consultation Process

Purpose of Symposium

In explaining its latest progress in evaluating and protecting species listed as threatened or endangered under the Endangered Species Act, USEPA Office of Pesticide Programs notes that “through the consultation process, the Services provide recommended measures for EPA to minimize harm to listed species from pesticides. These measures have traditionally been implemented after the consultation process is complete, leaving a gap between pesticide registration and implementation of mitigation measures. To close this gap, EPA is working before the completion of consultation, rather than after, to identify practical and effective mitigation strategies that may be implemented.” USEPA has also suggested to registrants that they consider upfront mitigations in their registration planning. However, there is not a uniform interpretation of upfront mitigation, how it should be addressed, and what possible impact it might have on both the risk to species and the user community.

This session will explore the nature of early mitigation proposals and how different stakeholders view their use, selection, and impact. The advantages and disadvantages of proposing and adopting mitigation early in the consultation process, or even before it begins, will be addressed from registrant, agency, and stakeholder viewpoints. The symposium welcomes attendance and participation from other ACS Divisions, including AGFD, ANYL, BIOL, ENVR and TOXI.

Suggested Topics

- Methods for developing practical and effective mitigation in new registrations
- What it would take to address mitigation needs for broad groups of products undergoing Registration Review, and would this be advantageous?
- Means of selecting “upfront mitigation” before all needs of registration and consultation have been completed
- Measuring or communicating how protections selected early reduce risk to listed species
- Potential stakeholder impact of broadly-based, early assigned species risk mitigation
- Opportunities, motives and incentives for pesticide industry engagement in proactive species conservation and recovery initiatives
- How would target pest effectiveness and the variation in local needs be accounted for?
- How could upfront mitigation measures fit into the product registration and consultation processes?

For further information, contact the organizers

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Uses of HPLC-Mass Spectrometry in Support of Agricultural Research and Development— New Trends and Best Practices

Purpose of Symposium

Advances in instrumentation and, more recently in software, have been some of the most important drivers in the way agricultural research and development (R&D) is done. Newer mass spectrometry instrumentation and data processing tools have provided better analyte selectivity, improved sensitivity, and higher throughput. Instruments incorporating accurate mass and high mass resolution capabilities significantly impact how studies are performed.

These advances have made lower cost instrumentation more available to laboratories in the ag Industry, contract research organizations (CROs), and academia. Accurate mass technology is now used routinely in all aspects of agricultural R&D, such as product discovery and development, product registration, and monitoring of food and environmental samples. This symposium will focus on many of these areas.

Other ACS divisions that may benefit from this symposium are ANYL, ENVR, and AGFD.

Suggested Topics

- Use of high resolution, accurate mass (HRAM) instrumentation for metabolite identification
- Use of role of HRAM / accurate mass instrumentation for quantitative analyses
- HRAM-based quantitative/qualitative workflows for pesticide discovery
- High throughput applications utilizing HRAM instrumentation
- Advanced software applications for metabolite identification and structural elucidation
- Applications of ion mobility mass spectrometry in Agricultural research and development
- The use of isotopic labeling of agrochemicals to assist in metabolite identification
- Applications using the accurate mass or high resolution capabilities of instrumentation in multi-residue analyses
- Mass spectrometry for confirmation in animal drug residues
- Targeted and non-targeted pesticide analyses
- Applications of MS-imaging in agricultural research and development
- Surprise us

For further information, contact the organizers

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