

TPSA 2010 ABSTRACT BOOK
[listed alphabetically by presenting author (name in caps)]

- AUTHORS Scott, Colin and Cameron BEGLEY, CSIRO Entomology, Canberra, Australia [Email: Cameron.Begley@csiro.au]
- TITLE **Enzyme enabled remediation of pesticide residues**
- ABSTRACT There are increasing concerns from both regulators and consumers around the world about residues of synthetic pesticides and herbicides in environmental and potable water and on horticultural commodities. A variety of remediation strategies have been tried, with variable levels of success, depending on the specifics of the contamination problem. However there have been no satisfactory remediation solutions for removing residues from contaminated waters, such as can be generated in the run-off from irrigated agriculture, animal and commodity dips etc. To address this need we have been developing a free-enzyme bioremediation technology which uses the catalytic efficiency and specificity of certain enzymes to deliver cost effective contaminant detoxification. Unlike other (microbial) bioremediation technologies, free-enzyme bioremediation is not dependent upon the growth of intact organisms, so the rate of detoxification is directly linked to the catalytic properties of the enzyme employed and the concentration of enzyme applied. Equally, the lack of reliance on whole organisms allows the use of modern enzyme engineering techniques to optimise the enzymes for the purpose, without requiring the release of genetically modified organisms. We have developed enzymes for several pesticides and herbicides and shown them to be fit for purpose in large-scale field trials. The first of them, for organophosphate insecticides, is now being used commercially in some jurisdictions. We will summarise some of the key technical and commercial issues involved in developing and deploying free-enzyme bioremediants for a range of applications.
- SESSION 5-6C
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- AUTHORS BROOKER, Deborah, OMAFRA, Ontario, Canada [Email: Deborah.Brooker@ontario.ca]
- TITLE **Options for Building an On-going Collection and Disposal Program for Unwanted Agricultural Pesticides and Animal Health Care Products In Ontario – Results of a Pilot Project and Feasibility Study**
- ABSTRACT Pesticide collection programs have been supported by industry and government partners in Canada for over 10 years. In 2009, CropLife Canada partnered with a diverse group of industry associations and the Ontario Ministry of Agriculture, Food and Rural Affairs to run a 3 day collection and disposal program for both unwanted pesticides and veterinary medicines as a free service to farmers. The 2009 initiative also included a feasibility study on options to establish an on-going program in Ontario that would provide a low cost, efficient, environmentally responsible system for farmers to collect and dispose of their unwanted pesticides and animal health care products.
- SESSION Poster
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- AUTHORS DENNY, Robert L. [Email: rdenny@arrowchase.com]
- TITLE **The Need and Approach for Visual Media in Support for Pesticide Container Stewardship**
- ABSTRACT A few years ago, the FAO saw the need to develop more uniform guidance on pesticide container stewardship, correctly recognizing container-handling challenges to human health, but also the creation of a "model" for container stewardship around the globe. The *predominantly text* 2008 **Guidelines on Management Options for Empty Pesticide Containers** normalizes the FAO ideals for empty pesticide container stewardship. Implementing this Code of Conduct is now a task before the world community. In some instances, this is not difficult; in other regions of the world it is not as easy. If a significant number of pesticide handlers cannot adequately read the FAO Code or any textual training materials, then environmental health remains a challenge. For example, of approximately 195 nations, 10 of the countries with the highest levels of illiteracy are disproportionately located in Equatorial or Central Africa and most of these nations have pesticide stewardship issues. Understanding any written language ("literacy") is not the only impediment to pesticide safety. In fact, the worldwide ability to read is quite high. One has to look below the ranking of 150 out of 195 nations to reach less than 66.6% literacy levels. *Ethnologue* lists 6,809 living world languages. This suggests that the largest impediment to communication is often *availability of training in a given language*, rather than illiteracy. The six FAO languages are a good start, but only a start. In 2008, The Pesticide Stewardship Alliance recognized the contribution of the FAO Code of Conduct for pesticide container stewardship and sought capacity building solutions to the issues of illiteracy and language diversity among users of pesticides. Arrowchase was the recipient of a grant to develop visual media to support the FAO Code. No attempt was made to alter the message of the FAO in any way, but merely to provide memorable visual cues that could be used by trainers anywhere in the world, even where translations are not available. This project is complete and will be freely available on the TPSA website.
- SESSION 2B-C
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- AUTHORS DENNY, Robert L. [Email: rdenny@arrowchase.com]
- TITLE **The Mandate for Sustainable, Local Treatment and Destruction Technologies for Pesticides and other Persistent Organic Pollutants**
- ABSTRACT Obsolete pesticide recovery and disposal programs began in North America and Europe in the 1980's and early 1990's. From that time until relatively recently, the prices of fossil fuels used for both incineration and transportation of the material destined for destruction were relatively low. Adjusted to current prices, the crude oil price per barrel was \$25 - \$50 USD during most of this phenomenal growth in pesticide stewardship. This favorable pricing structure changed in the last decade, and now with new concerns for global warming and excess long shipping routes, there is interest in emerging technologies that not only remove the need for thermal incineration, but allow the destruction technology to physically move to the contaminated site.
- SESSION 5-6C

AUTHORS FISHEL, F.M.¹, R. Clarke², J.L. Price², and D.W. Dubberly³ [Email: weeddr@ufl.edu]
¹Department of Agronomy, University of Florida, Gainesville, FL
²Florida Department of Environmental Protection, Tallahassee, FL
³Florida Department of Agriculture and Consumer Services, Alachua, FL

TITLE **Operation Cleansweep in Florida: A History of a Successful Pesticide Disposal Option**

ABSTRACT Operation Cleansweep is a free pesticide disposal program that has operated in Florida since 1995. The program is open to commercial facilities, including agricultural production establishments, golf course operators, and pest control companies. Since its inception, the program has had approximately 2,000 participants and collected more than 1,300,000 pounds of unused pesticides. Funding for the program has been primarily through the Florida Legislature and overseen by a steering committee represented by various state agencies, the University of Florida, and state commodity associations.

SESSION Poster

AUTHORS GAFFNEY, Jim [Email: james.gaffney@basf.com]
BASF Corporation, Technical Marketing Manager, 5401 Windy Gap Court, Raleigh, NC 27617

TITLE **Aerial Application Optimization: <https://agsync.com/>**

ABSTRACT Aerial application is the number one means of applying fungicides to corn and remains a nearly equally important service for soybeans, wheat, and numerous other crops. As the disease control and plant health segment has grown over the past five years the visibility of aerial application to those unfamiliar with agriculture has also grown. Research and evaluation of, and investment in, various tools, technology, and services to optimize aerial application were initiated in 2008 and 2009 to meet the numerous challenges. Investment in and evaluation of mapping technologies was initiated to determine the ability of applicators to view routes and obstacles and evaluate wind direction before leaving the ground. Initiatives were also undertaken to improve participation in Operation SAFE (Self-regulating Application & Flight Efficiency) Fly-Ins. Based on the results of these evaluations and initiatives, the agricultural aviation industry has the tools and technology available to meet the needs and expectations of a diverse group of customers, which include growers, regulators, and the public.

SESSION 5A

AUTHORS HIPKINS, P. A. Hipkins, D E. Mullins, K. Gamby, and I. Sidibé [Email: phipkins@vt.edu]
Department of Entomology, VA Tech, Blacksburg, VA 24061

TITLE **Development and Delivery of a Pesticide Safety Education Program in West Africa**

ABSTRACT Pesticide safety education is one component of a Quality Assurance program for horticultural crops grown in West Africa. Proper pesticide use facilitates acceptance of export crops and provides abundant safe food in local markets. Pesticide safety training also protects human health and the environment.
West African agricultural scientists and educators are actively involved in curriculum development and "train-the-trainer" sessions, which prepare field agents to deliver technical information about IPM and pesticide management to farmers. Support materials include lesson plans and poster books for trainers and booklets for farmers, which are available for general distribution as PDF files and can be accessed on the West African IPM web site.
Key Words: Pesticide safety education, West Africa, train-the-trainer, pesticide management

SESSION Poster

AUTHORS JACKSON, Scott [Email: scott.jackson@basf.com]
BASF Corporation, Stewardship and Strategy Manager

TITLE **Empirical Data Used for Label Statements**

ABSTRACT When crop protection products are released using sprayer technologies, a small fraction of spray solution may move off target. In order to ensure the safety of areas surrounding target spray zones, physical buffers may be used to ensure spray material does not reach sensitive areas. The process followed to derive spray area buffers includes models to calculate safe distances to sensitive areas. The modeling approach maybe the most practical way for determining buffer distances. Current FIFRA methodology was followed to derive physical buffer distances. Results from this examination indicate that buffer distances derived following current FIFRA methods are highly conservative, and refinements to current models is possible without risking sensitive areas.

SESSION 2A

AUTHORS JONES, Eugene B. [Email: gene@swix.ws, <http://swix.ws>]
Southern Waste Information eXchange, Inc.

TITLE **Collection and Processing of Waste Agricultural Film Mulch: A Case Study from Florida**

ABSTRACT Approximately 38 million pounds or 19,000 tons of waste agricultural plastic film mulch is generated per year in Florida. Typically this waste stream is either buried in Class 1 or 3 landfills or burned on-site in small piles within agricultural fields. While agricultural film plastic waste does not represent a large fraction of total solid wastes landfilled in the State of Florida, it is a problematic and voluminous waste stream in various counties within the State that generate large quantities of this plastic agricultural mulch. This presentation will review a pilot collection and processing project which looked at the feasibility of collecting and recycling this material.

SESSION 3B

AUTHORS KEIL, Sandra [Email: skeil@earth911.com, http://Earth911.com]
Earth 911, Vice President for Government Relations and Industry Affairs

TITLE **Communicating local pesticide disposal program information to consumers**

ABSTRACT Since 1991, Earth911.com has partnered with government to be the one stop shop for local recycling information. Through our bi-lingual hotline 1-800 CleanUp and state of the art website, consumers can find how and where to recycling in their own neighborhoods. Earth911.com has developed the tools and resources to make it simple and efficient for government entities to upload their program information into the Earth 911 system. Within 10 minutes these updates are live. As most pesticide programs are events, Earth911.com partnered with Yahoo! to display events on the website. As government and Earth911 work together, consumers truly benefit by this partnership in having easy access to important information.

SESSION 2B-C

AUTHORS KEIL, Sandra [Email: skeil@earth911.com. Web: Earth911.com]
Earth 911, Vice President for Government Relations and Industry Affairs

TITLE **Industry Engagement in the Earth 911 Product Stewardship Model**

ABSTRACT

SESSION 7B

AUTHORS KUNDU, Soumen, Arani Chanda, Sushil K. Khetan, Deboshri Banerjee, [Email: skundu@andrew.cmu.edu]
Leticia Espinosa-Marvan Anindyo Ghosh, and Terrence J. Collins
Carnegie Mellon University, Pittsburgh PA

TITLE **Total Degradation of Pure and Formulated Organophosphorous Pesticides by Catalytic Oxidation with Fe^{III}-TAML and H₂O₂**

ABSTRACT Organophosphorus (OP) insecticides account for an estimated 34% of worldwide insecticide sales and 70% of all pesticides used in the United States. The pest controlling benefits are often marred by inherent toxicity and especially by endocrine disruption associations that bring a new and troubling dimension to the health and environmental concerns of synthetic pesticides use. Existing chemical degradation approaches are expensive, difficult to use, and burdened by residual toxicity and post-treatment requirements. Thus, there is a need for an effective non-combustion degradation process for the safe and inexpensive disposal of unwanted OP pesticides.

The work presented will demonstrate the efficacy of FeIII-TAML/H2O2 in oxidatively degrading pure fenitrothion, parathion, methyl chlorpyrifos, including the parent compounds and the distinctive ligand on phosphorus. We will also present a simple methodology for destroying chlorpyrifos in an emulsifiable concentrate formulation under ambient laboratory conditions to small acids and simple minerals. The effectiveness of this versatile, easy-to-use, green process was demonstrated by the significantly reduced toxicity of the final reaction mixtures as measured by Microtox® assay. Multiple analytical techniques were used to monitor the reactions and detect the end products of the oxidation process.

SESSION 5-6C

Authors LAW, S. Edward [Email: edlaw@enr.uga.edu, http://www.enr.uga.edu/~edlaw]
Driftmier Engineering Center, University of Georgia, Athens, GA 30602-4435

TITLE **Air-Assisted Electrostatic Crop Spraying Halves Pesticide Total Environmental Load**

ABSTRACT Improved application technology, which incorporates aerodynamic energy and electric force fields to greatly enhance on-target deposition of reduced-volume and reduced-diameter pesticide sprays, achieves efficacious pest control typically using half or less active ingredient dispensed into the ecosystem...while proportionally reducing off-target drift. Fundamental physics underlying this air-assisted, electrostatic-induction, charged-spraying process dictates small droplets in the 30-40 micrometer median-diameter range in order for electric forces to exert droplet control tens-of-times greater than gravity (e.g., see video of spray charging OFF-ON-OFF-ON at www.ael.enr.uga.edu/downloads/ElectrostaticSprayingBlueberry.mpg). Unfortunately, well intentioned standards and label restrictions which set minimum values for gal/acre and droplet diameters, in an attempt to control the problems of off-target drift from conventional hydraulic-atomizing nozzles, severely impede commercial implementation of this proven alternative application technology and others. The presentation briefly reviews the scientific basis of the process, its engineering development, commercialization via U.Ga. patent licensing (www.maxcharge.com), and documentation of its performance as reported in over 100 refereed-journal publications spanning the past three decades.

SESSION 3A

AUTHORS LEVITAN, Lois [Email: lcl3@cornell.edu]
Program Leader, Recycling Ag Plastics Project
Department of Communication, Cornell University, Ithaca NY 14853

TITLE **Recycling Ag Plastics Project (RAPP): Life Cycle Stewardship of Agricultural Plastics**

ABSTRACT The Recycling Ag Plastics Project is developing infrastructure and markets for the waste film and rigid plastics that are generated from dairy, livestock, horticulture, maple syrup production and other sectors of agriculture. RAPP is working with partners from the agriculture and solid waste/recycling communities to develop full service ag plastic collection programs in New York State, and to figure out how to make these and other ag plastics recycling programs sustainable.

The collection of agricultural plastics for recycling (as well as for re-use and other value-recovery processes) has not been easy because they are typically dirtier than other used plastics, and may be contaminated by mixed resins and chemical residues. They

are also bulky and widely dispersed across the rural landscape, all of which adds complexity and cost to collection. To jump these hurdles, RAPP is: (i) promoting farmer adoption of best management practices to keep ag plastic in condition to be recycled; (ii) acquiring mobile baling equipment to compact used plastic for cost-efficient transport from farms to recyclers; (iii) cultivating manufacturing markets to process used plastic into new products such as plastic lumber, roof tiles and sweet crude oil; (iv) promoting consumer purchase of products made from recycled ag plastics; and (v) facilitating an international dialog to further the product stewardship of agricultural plastics.

RAPP is a Cornell University-based collaboration with agriculture producers and organizations, agencies and businesses representing agriculture, environmental protection, economic development, and solid waste/recycling. Funding has come from the NY Farm Viability Institute, the NYS Department of Environmental Conservation, US EPA Region 2 Pollution Prevention, USDA Rural Utilities Services/NEWMOA, USDA Hatch/Smith-Lever. On the web at <http://environmentalrisk.cornell.edu/AgPlastics>.

SESSION Poster

AUTHORS MULLINS¹, Donald E, Pat A Hipkins¹ and Margaret I Jones² [Email: mullinsd@vt.edu]
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²Pesticides Section, Chemicals Management Branch, Land and Chemicals Division, US EPA Region 5, 77 West Jackson Boulevard, LC-8J, Chicago, IL 60604

TITLE **Development of a Training Program for Triple Rinse and Disposal of Pesticide Containers in Developing Countries**

ABSTRACT Risks associated with exposure to pesticides from unrinsed or poorly rinsed containers are still very real in many parts of the world. Reports of illness associated with the reuse of improperly rinsed containers continue to appear. Inappropriate disposal can also lead to contamination of precious resources including drinking water sources and ecosystems. As a result, there is a need for pesticide safety programs in developing countries to educate users on the need for triple rinsing and rendering pesticide containers unusable before disposal. This process is compromised because in many parts of the world empty containers have value and are often reused with serious consequences. We are developing a "basic" triple rinsing and pesticide container destruction and disposal scenario for audiences in countries where conditions and facilities may be rudimentary.

SESSION Poster

AUTHORS O'CONNELL, Cathryn [Email: Oconnell.Cathryn@epamail.epa.gov]
US Environmental Protection Agency, Office of Pesticide Programs

TITLE **Overview of EPA's PRN Notice for Pesticide Drift**

ABSTRACT The session will cover the process EPA is undertaking with the Pesticide Registration Notice (PRN) for Spray Drift Labeling, general themes of comments received and EPA's plan for moving forward with the PRN.

SESSION 4A

AUTHORS PIERDANT, Norah Pierdant and Rene CORNELLIER [Email: rcornellier@fralma.com, npierdant@fralma.ca]
FRALMA Technologie Inc., 91, chemin des Patriotes; Saint-Mathias, Québec, Canada, J3L 6A1

TITLE **The Fralma Mobile Unit for the Destruction of Pesticides and PCB-Contaminated Oil**

ABSTRACT The most widespread and most effective technique for destroying PCB-contaminated oil is high temperature incineration or thermal destruction. Properly employed, it allows the PCBs/PCTs contained in these oils to be effectively destroyed without endangering the environment or human health. It is particularly effective for destroying oils contaminated with high concentrations. When improperly done, there is the possibility of highly toxic and harmful dioxin and furan emissions. But a series of parameters exists to ensure that incineration is effective and that the constituents are destroyed. Temperature, gas flow, and residence time are just some of the parameters that must be scrupulously followed and observed to ensure that a destruction rate of 99.9999% and over is attained. These parameters do not change, regardless of the size of the facility involved. So far contaminated oil with high PCBs concentration has been done by large-scale incineration plants. The FRALMA Unit presents an innovative way that can properly deal with destruction of high PCBs concentrations, in a small piece of equipment. With the Stockholm Convention deadlines for store PCBs contaminated oil destruction just around the corner; this 1 ton/day capacity piece of equipment not only represents an economic way of destruction, but an advantage to the environment, eliminating transportation, handling and shipping costs of hazardous wastes to far locations.

The prototype used during tests in Canada was built in 2002 and updated during 2005-2009. The first commercial unit to Brazil was shipped in January 2010.

The commercial unit's main components are:

- Oil contaminated reservoir: (UN Approved) with pumping and homogenizing systems
- Combustion chamber at 99.9%: running at 850° C with diesel and using the contaminated oil itself when it gets to the right temperature as fuel to continue the batch.
- Destruction chamber: running at 1,200° C and destroying all furans and dioxins, offers an efficiency of 99.9999% or better. Both chambers have sealed doors to facilitate cleaning inside the chambers when necessary.
- Exhaust and flue gas cooling tube: that lowers the temperature of the gas from 1,200 to 500° C. The cooling tube presents a unique delta to this process.
- Dry scrubber system: that utilises zeolite cartridges to capture chlorine.
- Detachable chimney: with samples probes to continuously read CO, HCL, CO2, O2, SO2 emissions.
- PC controls for gas analyzer and operation: with a custom made program that offers the possibility of creating a variety of statistics, comparisons and profiles.
- Continuous gas analyzer system
- Diesel generator: for remote areas

SESSION 5-6C and Poster

AUTHORS PRZEPIORA, A.¹, Seech, A.² and Mueller, J.³ [Email: andrzej.przepiora@adventusgroup.com]
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²Adventus Americas, Corona Del Mar, CA
³Adventus Americas, Freeport, IL

TITLE **Remediation of Soils Impacted by Organochlorine Pesticides Using the DARAMEND® Technology**

ABSTRACT DARAMEND® is an advanced biological treatment technology for soil, sediment and solid wastes contaminated with recalcitrant organic compounds. When applied to organochlorine pesticides (OCPs), the key to this remedial approach is composition of the DARAMEND soil amendment and application of repeated and sequential anoxic and oxic conditions to the soil matrix. The patented soil amendment is comprised of plant fiber-based organic material and reduced, micro-scale iron. The treatment results in the sequential reductive dechlorination and aerobic biodegradation of chlorinated organic compounds. The amendment is typically applied at low rates (i.e.; <4% w/w) and therefore causes very little, if any, bulking of the soil volume following treatment. Over the last 15 years, the technology has been used successfully for in-situ and ex-situ treatment of soils contaminated with a range of OCPs, including HCHs, DDT, toxaphene, 2,4-D, atrazine, dieldrin and metolachlor at sites in North America and Europe.

This presentation will include an overview of treatment mechanisms for OCP degradation using DARAMEND. In addition, results from recent field applications of the technology will be presented.

SESSION 5-6C

AUTHORS RACK, Ralph, USAID/Deliver Project [Email: rrack@jsi.com]

TITLE **100 million replacement Long-Lasting Insecticide-Treated Bed Nets (LNs) to be distributed by the end of 2010: Are the old ones a potential threat?**

ABSTRACT International efforts to scale up malaria control have greatly expanded LN coverage with over 60,000,000 LNs distributed in 2008 and an estimated 250,000,000 additional LNs to be distributed by 2010. What does this possibly mean? What are people currently doing with their old nets, when they stop using these nets for sleeping? Are they thrown away or used for other purposes. What benefits and risks arise from these other uses? If there are harmful effects from these old nets, they are already occurring on a large and rapidly expanding scale.

The global public health community needs to urgently explore options for LNs eventual fate that are environmentally, socially and economically acceptable.

A demonstration project of environmentally-sound management (ESM) of LNs, is currently being developed to explore whether and when expired nets are an issue and identify options to prevent the potential impact of expired nets and promote a life-cycle approach to product management.

In addition, a number of LN manufacturers are exploring options for identifying and tracking LNs to ease collection and redistribution and investigating possible recycling options. They are also looking at limiting the environmental impact of net distribution by developing biodegradable bags and non-bag distribution options.

This presentation will share preliminary findings from the demonstration project and highlight other initiatives that may provide options for limiting the potential adverse impacts of this life-saving intervention.

SESSION Poster

AUTHORS RAMSAY, Carol [Email: ramsay@wsu.edu]
Extension Pesticide Education Specialist, Washington State University, Pullman, WA

TITLE **Temperature Inversions**

ABSTRACT Label references to temperature inversions vary greatly and there is a need to standardize a reasonable statement that captures the concerns for the level of the inversion as well as the length of the inversion. Different label statements will be shared and discussed in an open forum.

SESSION 6A

AUTHORS RIGGS, Jennifer Lynn [Email: xxxxx]
Product Development Manager, Bayer CropScience.

TITLE **Seed Treatment: Innovation Driven, Environmental Friendly, Committed to Plant Health**

ABSTRACT Seed Treatment is often forgotten when the conversation turns to concerns with agricultural pesticides. In their own right, seed treatments should be considered environment and worker friendly. The application of a treatment to the seed has been described by some as an art and by others as a science. It is probably a little of each. Specialized equipment is used to deliver very small quantities of active ingredients to the surface of a seed, which in some instances is no larger than the point of a ballpoint pen. Advances in application technology have resulted in very little exposure to workers in seed conditioning plants. Since seed is normally planted into soil there is little chemical transported into the air. Beyond the advancement in application technology, the chemicals used as seed treatments have evolved since the days of the contact elements. Seed treatments can be applied at rates of active ingredients per seed, assuring protection to each seed planted, as well as minimizing environmental contact. While no system is fail proof, the advancement in seed treatments by several recent innovations can reduce the risk of unwanted exposure of pesticides to the environment.

SESSION 1A

AUTHORS SHIMME, Kaoru¹, Kohei Takase², Munehito Mizuno², Akemi Okawa¹ [Email: kor-shimme@radicalplanet.co.jp]
¹Radicalplanet Research Institute Co. Ltd., Nagoya-City, Japan
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TITLE **Radicalplanet® Technology (RPT): Alternative Technology for Destruction of Obsolete Pesticides**

ABSTRACT RPT uses a mechano-chemical principle to destroy obsolete pesticides. The treatment occurs in a concrete vessel where steel balls and a detoxification agent, such as CaO, are placed prior to the introduction of the wastes. The vessels are then sealed and placed on the RadicalPlanet machine for rotation. As the steel balls crash into each other, the bonds of the POPs and CaO molecules are broken by mechanical energy. This process transforms these organo-compounds into their "radical" state by use of the "planetary mill" principal. Chlorinated hydrocarbons are chemically altered into CaCl₂ and non-chlorinated organic compounds. No effluent or off-gases are generated from this treatment process. The toxic equivalent of the end product is less than 1 pg-TEQ/g and the destruction removal efficiency (DRE) is over 99.9999%. Full-scale applications of this technology have been conducted in Japan.

SESSION 5-6C

AUTHORS WALTZ, Clint [Email: cwaltz@uga.edu]
Extension Turfgrass Specialist, University of Georgia Turf Grass Management, Griffin, GA

TITLE **Perceptions and Reality: Pesticide Use on Golf Courses**

ABSTRACT Golf course superintendents endeavor to provide a quality playing surfaces while being environmental stewards. These two objectives are not mutually exclusive. From some groups a misperception exists that pesticides must be utilized to achieve high quality, visually attractive golf courses. While pesticides are used, they serve the golf course superintendent as a tool in overall turfgrass management. Similar to basic agronomic principles, like mowing and aerification are part of an overall turfgrass management program. In this presentation, a brief history of pesticide use along with the pervasive IPM philosophies for golf course management will be presented. Additionally, common approaches to pest management, including holistic views of the turfgrass ecosystem and impacts of the system on pesticide use, will be discussed. The participant will depart with an understanding that pesticides may be judiciously used on golf course but use is specific, appropriate, and superintendents use an environmental awareness to direct their overall pest management programs.

SESSION 5-7D

AUTHORS WOLF, Bob [Email: rewolf@ksu.edu]
Extension Specialist, Application Technology, Kansas State University, BAE Dept.

TITLE **Comparisons of Drift Reduction Products**

ABSTRACT A field study using an Air Tractor 502A configured with CP-11TT (#15) flat-fan nozzles flying at an average speed of 156 MPH was used to compare ten drift control products for downwind horizontal and vertical drift characteristics. Results of the study show that drift control/deposition aid products added to the tank mix do affect the amount of horizontal and vertical spray drift for the application scenarios and operating conditions used. Results indicate that several products tended to result in more downwind deposits when compared to water while others reduced the amount of downwind drift deposits. Significant differences were found.

SESSION Poster

AUTHORS WU, Qinglin [Email: qwu@agcenter.lsu.edu]
School of Renewable Natural Resources
Louisiana State University Agricultural Center, Baton Rouge, LA 70803

TITLE **Tiger Bullets – A Potential Outlet For Used Ag Plastic Films**

ABSTRACT TigerBullets® is a coarse-sized plugging material used to bridge and seal permeable formations in water, oil, or synthetic based drilling fluid (mud) systems. It can be used for lost circulation control and as additives for cementing operation. TigerBullets® does not affect rheological properties of the mud. Laboratory Permeability Plugging Test (PPT) shows that the material can lead to a quick seal of the crack, and thus lower the spurt and overall filtration losses. The material helps reduce torque and drag by increasing lubricity during field applications.

SESSION Poster (Poster-Presentation Session 1B)

AUTHORS ZEEB, Barbara A.¹ and A. Rutter² [Email: zeeb-b@rmc.ca]
¹Royal Military College of Canada, Department of Chemistry & Chemical Engineering
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²Queen's University

TITLE **Practical Aspects of Phytoextraction: Six Years of Field Studies at Sites Historically Contaminated with Persistent Organic Pollutants (POPs)**

ABSTRACT It has now been repeatedly demonstrated that certain plants, in particular some Cucurbits, have the ability to take up and store significant concentrations of persistent organic pollutants (POPs), such as PCBs and DDT, in their shoots. Further work has investigated the effects of soil amendments and growing conditions on POP uptake, and the mechanisms of POP uptake by plants. These studies have resulted in some significant successes in POPs phytoextraction; - soil concentration of POPs has been observed to decrease significantly after 2-3 plantings and accumulations of POPs concentrations in parts of the plant shoot have been observed that are greater than or equal to that of the soil. Given these successes, it is important to now consider some of the more practical aspects of phytoextraction that need to be understood before this technology can be successfully implemented at

the commercial scale.

The goal of phytoextraction is to reduce the mass of contaminated solids for transport and treatment offsite. In order for this to occur, the final phytoextraction-generated plant material must have a higher contaminant concentration than the original contaminated soil. If the harvested shoot material consistently achieves contaminant concentrations greater than the original soil contaminant concentration, disposal of contaminated vegetation directly will be more economical than disposal of the contaminated soil. Moreover, composting of phytoextraction-generated plant waste reduces the mass of the contaminated plant matter, thereby increasing the contaminant concentration and further decreasing transportation and treatment costs. We will report on the degradation of PCB congeners during composting.

Since PCB phytoextraction takes place in situ, another practical issue that must be accounted for is the effects of the phytoextraction process on the surrounding natural environment. Since the root exudates of some *C. pepo* plants have been shown to increase the aqueous solubility of certain POPs, it is possible that growth of these plants in POPs-contaminated soil could increase POPs bioavailability to non-target organisms. Our current studies at two field sites in Ontario are looking at the impact of phytoextraction activities on PCB bioavailability to native soil invertebrates.

Finally, a challenge of studying POPs is that the analysis of plant material is expensive and time consuming. We focussed on determining the minimum number of samples required for analysis of a whole plant and from which part of the plant these samples should be collected. Keywords: phytoextraction, polychlorinated biphenyls, field studies, *Cucurbita pepo*

SESSION

5-6C