



Pesticide Formulations and Application Systems Twelfth Volume

Devisetty/Chasin/Berger
editors



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***Pesticide Formulations and
Application Systems:
12th Volume***

Bala N. Devisetty, David G. Chasin, and Paul D. Berger, editors

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The quality of the papers in this publication reflects not only the obvious efforts of the authors and the technical editor(s), but also the work of these peer reviewers. The ASTM Committee on Publications acknowledges with appreciation their dedication and contribution to time and effort on behalf of ASTM.

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Foreword

This publication, *Pesticide Formulations and Application Systems 12th Volume*, contains papers presented at the Twelfth Symposium on Pesticide Formulations and Application Systems held in San Diego, CA on 16–17 Oct 1991. The symposium was sponsored by ASTM Committee E-35 on Pesticides and its Subcommittee E35.22 on Pesticide Formulations and Application Systems. Bala N. Devisetty of Abbott Laboratories served as symposium chairman. David G. Chasin of ICI Specialty Chemicals and Paul D. Berger of Witco Corporation served as symposium co-chairmen. These men also served as co-editors of this publication.

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Overview

The twelfth ASTM Symposium on Pesticide Formulations and Application Systems, sponsored by ASTM Committee E-35 on Pesticides and its Subcommittee E35.22 on Pesticide Formulations and Application Systems, was held on 16–17 Oct 1991 in San Diego, CA. The technical aspects of pesticide formulations and application technologies contributing to the effective and responsible use of pesticides were the broad focus of this symposium. The 27 research papers presented and published in this volume reflect a diversity of professional and international affiliations and interests in this increasingly sophisticated and interdisciplinary field of technology.

The keynote speaker, R. L. Denny, USEPA, discussed the pesticide management and disposal in the 1990's and challenges for testing and materials research. The invited speaker, R. J. Cibulsky, reviewed progress and future trends on application technologies for microbial pesticides.

A special session addressed pesticide packaging and management issues. R. F. May of E. I. DuPont de Nemours and Company spoke of the urgent need for recycling of pesticide containers due to shortage of landfill space and restrictions on open field burning. R. L. Denny, USEPA, reviewed the current status of pesticide container management in the United States. B. A. Omilinsky and A. D. Lindsay of Formulogics, Inc., recommended that containers must be designed in a way to avoid the human and environmental exposure caused by the gugging of liquids during a pour.

The STP is organized into four sections. The first section, Novel Surfactants and Their Properties, includes four papers and discusses research on new and novel surfactant systems derived from natural and renewable raw materials for improving physical and biological properties of pesticide formulations and their biological performance. The second section, with 14 papers, Pesticide Formulation Technologies, covers diverse formulations technologies such as concentrated emulsions, microemulsions, microcapsule suspensions, paucilamellar lipid vesicles for the delivery of agricultural fungicides, and Culigel® controlled release formulations. The third section, Pesticide Packaging and Management, covers a paper on Container Design and Glug. Eight papers covered in the final section, Pesticide Application Technologies, discuss research on droplet size and analysis, spray deposition and retention, drift control and efficacy.

Novel Surfactants and Their Properties

Hoorne et al. showed improved field efficacy of herbicides and fungicides by the use of novel alkylpolysaccharide based adjuvants. Fiard reviewed sucroglyceride surfactant synthesis, physicochemical properties, ecotoxicology, and potential use in water based formulations such as microemulsions and suspoemulsions. Aleksejczyk reviewed unique chemical and physical properties of a new class of non-ionic biodegradable surfactants broadly classified under alkyl polyglycosides. Murphy et al. showed that aqueous solutions of the silicone surfactants lower surface tension more quickly, spread better on paraffin wax film, and yield lower static surface tension values than corresponding aqueous solutions of the hydrocarbon surfactants.

Pesticide Formulation Technologies

According to Friloux and Tann, concentrated emulsions must be evaluated by a variety of methods including viscosity, emulsion performance, accelerated aging stability, and par-

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title size Derian et al. concluded that tristerylphenol based surfactants exhibit an excellent ability to microemulsify pyrethroids. Narayanan and Chaudhuri explained the role of N-alkyl pyrrolidones in achieving stable microemulsion formulations of carbaryl and a number of pyrethroids. Results by Haack and Warwick showed that methylchloroisoithiazolone (MCI) kills microorganisms in aqueous formulations as effectively as formaldehyde, but at significantly lower concentrations. Ibrahim and Mehra studied potential uses of microcrystalline cellulose as a thickener in aqueous flowable formulations. Studies by Utz et al. showed that EO/PO block copolymers are useful for stable aqueous pesticide formulations. Papers by Stern and Dexter, King and Verbelen, Dean, Tabibi et al., Namnath, Botts, and Kallay et al. showed improved methods of formulation development and evaluations. The paper by Levy et al. showed potential uses for acrylamide and acrylate superabsorbent polymers in the development of controlled release delivery systems for pesticides.

Pesticide Application Technologies

The paper by Hall et al. provides guidelines to fluorescent tracers used to measure off-target pesticide deposition. According to Steinke and Akesson, additional research is required in the development of atomizers adapted to high viscosity liquids. K. M. S. Sundaram studied permethrin deposition and persistence in canopy foliage of a plantation forest. A. Sundaram's studies on aerial spray deposits of *Bacillus thuringiensis* over hardwood forests showed that volume rates of application played an important role on drop size spectra obtained at the tree canopy and ground levels. Benefits of using an anti-evaporant in pesticide formulation was studied by Thacker and Hall. Kirk et al. showed ovicide formulation and aerial application parameters to influence control of tobacco bud worm on cotton. Keeney and Noveroske showed that paraffinic oil can increase foliar activity of the herbicide aryloxyphenoxypropionate. The final paper by Salyani and Cromwell showed that the invert emulsion oil and the polymers to be effective in reducing drift from hand gun applications.

This STP provides much needed information on the current trends in pesticide and adjuvant formulations for everyone working in industry, universities, and government agencies. Thus, these research papers confirm that the objectives of the symposium have been met. This STP provides significant scientific information on latest developments in pesticide formulation and application technologies that will guide ASTM Subcommittee E35.22 members in the development of standards.

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