

Pesticide Formulations — AND — Application Systems

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***Pesticide Formulations and
Application Systems:
11th Volume***

Loren E. Bode and David G. Chasin, editors

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Peer Review Policy

Each paper published in this volume was evaluated by three peer reviewers. The authors addressed all of the reviewers' comments to the satisfaction of both the technical editor(s) and the ASTM Committee on Publications.

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.

Foreword

This publication, *Pesticide Formulations and Application Systems: 11th Volume*, contains papers presented at the symposium of the same name, held in San Antonio, TX on 14–15 Nov. 1991. The symposium was sponsored by ASTM Committee E-35 on Pesticides and its Subcommittee, E35.22 on Pesticide Formulations and Application Systems. Loren E. Bode of the University of Illinois at Urbana and David G. Chasin of ICI Specialty Chemicals in Wilmington, DE, presided as symposium co-chairmen and are editors of the resulting publication.

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Overview

The 11th Symposium on Pesticide Formulations and Application Systems began the second decade of increased interaction between pesticide formulators, application scientists, and regulatory personnel. For increased efficiency and safety of pesticide use, more knowledge of the technical and regulatory aspects of formulations and application parameters must be obtained and shared among the disciplines involved with pesticides. The purpose of the symposium was to:

- Provide a forum for exchange of ideas and data among chemists and engineers working to improve the efficiency of pesticide use.
- Provide a data base to support ASTM Committee E-35 in development of guides and standards.
- Serve as a guide to Subcommittee E35.22 members in their future efforts to address the issues related to the use of pesticides.

This volume, in addition to previous symposia proceedings, adds significantly to the available resources on the important subject of pesticides. Topics in this STP include the technical aspects of pesticide application and formulation research, including equipment and concepts contributing to the effective and responsible use of pesticides. Safety aspects of pesticides are included as an integral part of pesticide development and use. Direction and suggestions for the development of standards were made available from material presented at the symposium.

The 22 papers in this STP are organized into three sections. The first section, *Safety and Environmental Impacts*, includes seven papers regarding humans, food, environmental issues, and presents new technology to insure that our safe supply of food is maintained. The second section, *Characteristics of Formulations and Adjuvants*, includes research regarding pesticide formulation and adjuvant technology. Seven papers regarding pesticide application comprise the final section, *Application Techniques and Pest Control*. This section includes research on new application systems and evaluations of pest control.

Safety and Environmental Impacts

Pesticide effects on the environment is a major factor in effective pesticide use. The papers in this section discuss some of the safety aspects of using pesticides to produce our food supply. The paper by Cummings compares the proposed California food safety initiatives and discusses the potential effects on formulation chemists and inert ingredient suppliers. Kogan and Gieseke's paper presents a computer model that provides quantitative information on human exposure to airborne particles in closed environments. Point source contamination of groundwater from loading and mixing sites can be prevented by use of a CARBO-FLO water treatment developed by Ohio State University. The treatment process uses a simple flocculation and filtration system that is described in the paper by Hall, Downer, and Chapple.

Controlled release granular formulations have the potential of reducing the amount of pesticide applied. Papers by Shasha and Wing present state of the art research regarding encapsulated herbicides. Stein describes a method to monitor release of pesticides from

granules into the soil, and Meyers showed that the change in release rate of chemicals in response to temperature is unique to microcapsules made from Intelimer polymers.

In addition to the formal papers, D. Lindsay and B. Omilinsky, EPA subcontractor Formulogics personnel, were invited to address the complex issues on the proposed rules regarding container management that is contained in FIFRA 88. The discussion provided a very interactive conclusion to the 11th symposium that was of value to the domestic as well as many international attendees who actively provided input regarding the rules being developed by the EPA.

Characteristics of Formulations and Adjuvants

Narayanan and Chaudhuri present a working model for emulsifiable concentrate formulations that explains the generality for the concentrates and high stability of emulsions observed on dilution with water. Duckworth and Cearnal present the results of a study to determine the effect of carrier temperature on the emulsification or dispersion of pesticide formulations. They suggest that the current ASTM standard be revised to include water temperatures that depend on the end use conditions of the pesticide. Becher shows that for testing compatibility in the laboratory, carriers must be representative of the type actually used in the field. Tann, Berger, and Berger demonstrated the application of dynamic surface tension to the study of adjuvants and emulsion stability.

Application Techniques and Pest Control

Wright described the new Expedite Pesticide Applicator System that is a combination of ready to use pesticide formulations, closed system packaging, and state-of-the-art, low-volume, controlled-droplet spray delivery. Ozkan outlined a comprehensive and complete set of guidelines which may help revise ASTM Standard E 641 that deals with measuring the wear rate of nozzle tips.

Biological results from pesticide application were presented by Chambers, Prasad, Manthey, and Riley. Chambers paper shows that mineral oil as a carrier for low volume applications was superior to vegetable oils in weed control efficacy. Prasad found that some adjuvants enhance the effectiveness of glyphosate sprays without damaging the crop species and discussed the relation of droplet size to phytotoxicity. Manthey reported on the relationship between phytotoxicity of a postemergence herbicide and the physical properties of surfactants. Riley's paper provides a detailed assessment of spray deposition and efficacy from insecticides, when aurally applied to stands of fir for control of the western spruce budworm.

These papers confirm that the objectives of the symposium were met. This STP (in conjunction with previous symposia STPs, provides a database of information regarding pesticide formulations and application systems that will guide ASTM Subcommittee E35.22 members in the development of necessary standards.

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