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Following the original initiative of the International Organisation for Biological Control some 15 years ago, research groups and agrochemical companies have been investigating the effects of pesticides on beneficial organisms, devising laboratory and field test methods and lately developing protocols for regulatory testing requirements in Europe. This work, and the application of agreed protocols for testing, is of crucial importance to the environmentally acceptable use of pesticides and to the further development of Integrated Pest Management systems, and the objective of this book is to review the origins and progress of the research - what has been accomplished, what is the current position and what still needs to be done. Worldwide concern in scientific, industrial, and governmental communities over traces of toxic chemicals in foodstuffs and in both abiotic and biotic environments has justified the present triumvirate of specialized publications in this field: comprehensive reviews, rapidly published progress reports, and archival documentations. These three publications are integrated and scheduled to provide in international communication the coherency essential for nonduplicative and current progress in a field as dynamic and complex as environmental contamination and toxicology. Until now there has been no journal or other publication series reserved exclusively for the diversified literature on "toxic" chemicals in our foods, our feeds, our geographical surroundings, our domestic animals, our wild life, and ourselves. Around the world immense efforts and many talents have been mobilized to technical and other evaluations of natures, locales, magnitudes, fates, and toxicology of the persisting residues of these chemicals loosed upon the world. Among the sequelae of this broad new emphasis has been an inescapable need for an articulated set of authoritative publications where one could expect to find the latest important world literature produced by this emerging area of science together with documentation of pertinent ancillary legislation. This book addresses the grave concerns stemming out due to conventional treatment techniques. The main focus of this book revolves round the central kernel of novel technology (bioremediation and biotechnology) which has emerged as an independent warrior to clean up and restore the disturbed environs. Furthermore, this book is a coherent assortment of diverse chapters relevant to the role of biotechnology and bioremediation for restoration of the ecosystems degraded by pesticide and heavy metal pollution. The inaugural chapters deal with the quantification of problem and its magnitude due to pesticides and heavy metals, followed by innovative modern biotechnological and bioremediation treatment technologies and sustainable techniques to remediate the persistent pollutants. It is a detailed comprehensive account for the treatment technologies from unsustainable to sustainable. Academicians, researchers and students shall find it as a complete wrap up regarding biotechnological intervention for sustainable treatment of pollution and shall suffice for the diverse needs of teaching and research. "Rachel Carson's seminal book *Silent Spring*, published in 1962, stands as one of the most important books of the twentieth century. Powerful and eloquent, the book exposed the dangers of indiscriminate chemical pesticide use. It also inspired important and long-lasting changes in environmental science and government policy. In this thought-provoking volume, Frederick Rowe Davis sets Carson's scientific work in the context of the twentieth century, reconsiders her achievement, and analyzes the legacy of her work in the light of toxic chemical use and regulation today. Davis examines the history of pesticide development alongside the evolution of the science of toxicology. He also tracks legislation governing exposure to chemicals from the early 1900s to the end of the century. Against this historical backdrop, the author affirms the brilliance of Carson's careful scientific interpretations drawing on university and government toxicologists. And yet, while *Silent Spring* instigated legislation that successfully terminated DDT use, other warnings were ignored. Carson and others recognized the extraordinary toxicity of organophosphate insecticides, yet until recently these dominated pesticide markets in the United States and worldwide. In a tragic irony, one poison was replaced with even more dangerous ones. This compelling book urges new thinking about the ways we develop, use, evaluate, and regulate pesticides while taking into account their ecological and human toll."--Jacket. This book is a tutorial designed to instruct the reader in use and application of immunochemical methods of analysis for environmental contaminants. A brief introduction describes basic principles and the advantages and disadvantages of the technology, and gives a listing of references which supply more detail. Preparation of the laboratory for use of this technology and the general scientific considerations prior to using the technology are discussed. Detailed step-wise procedures are given for analysis of selected analytes, triazine herbicides, carbaryl, paraquat, and p-nitrophenols, etc. In addition to the specific immunoassay methods, a series of support techniques necessary to perform immunochemical methods are described. This book provides specific instruction for certain analytes, but also serves to familiarize the novice reader with many generic concepts needed to successfully utilize immunochemistry technology including: applications, sampling, sample preparation, extraction, cleanup, quality assurance, methods development and optimization, data handling and troubleshooting. It is not necessary for the reader to actually perform the immunoassays given in this user's guide to obtain familiarity with these concepts. The guide is written so that the information presented can be applied to other immunoassays not given here. Thus, the strength of the guide is its universal applicability to immunoassay methods. Over the last five decades pesticides have undoubtedly helped to increase agricultural production and control vectors of disease, however the environmental impact of long term agro-chemical use has been cause for concern along with the effects on human health. In *Pesticides*, Graham Matthews begins by looking at the developmental history of pesticides, and how crop protection was achieved before they were in use, how pesticides are registered for use and what happens to pesticides in food and the environment. Pesticide application and operator safety is investigated and the future of pesticides in light of the development of genetically modified crops is explored. Provides commercially important information for the agro-chemical industry. Addresses all aspects of public concern relating to human health and the environment, including spray drift, bystander, resident and worker exposure. Looks at the future of pesticides in light of the increasing prevalence of genetically modified crops. Collecting together the most recent research in the area in a single volume, this book is a vital resource for agricultural scientists, agronomists, plant scientists, plant pathologists, entomologists, environmental scientists, public health personnel, toxicologists, crop protection personnel and all those involved in the agrochemical industry and government pesticide registration and legislation. Worldwide concern in scientific, industrial, and governmental communities over traces of toxic chemicals in foodstuffs and in both abiotic and biotic environments has justified the present triumvirate of specialized publications in this field: comprehensive reviews, rapidly published progress reports, and archival documentations. These three publications are integrated and scheduled to provide in international communication the coherency essential for nonduplicative and current progress in a field as dynamic and complex as environmental contamination and toxicology. Until now there has been no journal or other publication series reserved exclusively for the diversified literature on "toxic" chemicals in our foods, our feeds, our geographical surroundings, our

domestic animals, our wild life, and ourselves. Around the world immense efforts and many talents have been mobilized to technical and other evaluations of natures, locales, magnitudes, fates, and toxicology of the persisting residues of these chemicals loosed upon the world. Among the sequelae of this broad new emphasis has been an inescapable need for an articulated set of authoritative publications where one could expect to find the latest important world literature produced by this emerging area of science together with documentation of pertinent ancillary legislation. That residues of pesticide and other "foreign" chemicals in food stuffs are of concern to everyone everywhere is amply attested by the reception accorded previous volumes of "Residue Reviews" and by the gratifying enthusiasm, sincerity, and efforts shown by all the individuals from whom manuscripts have been solicited. 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Adequate safety-in-use evaluations of any of these chemicals persisting into our foodstuffs are not simple matters, and they incorporate the considered judgments of many individuals highly trained in a variety of complex biological, chemical, food technological, medical, pharmacological, and toxicological disciplines. It is hoped that "Residue . . . Reviews" will continue to serve as an integrating factor both in focusing. That residues of pesticide and other contaminants in the total environment are of concern to everyone everywhere is attested by the reception accorded previous volumes of "Residue Reviews" and by the gratifying enthusiasm, sincerity, and efforts shown by all the individuals from whom manuscripts have been solicited. 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Adequate safety-in-use evaluations of any of these chemicals persisting into our foodstuffs are not simple matters, and they incorporate the considered judgments of many individuals highly trained in a variety of complex biological, chemical, food technological, medical, pharmacological, and toxicological disciplines. The book covers a critical compilation of analytical methods used for the monitoring of pesticides and their degradation products in water. It contains up-to-date material and is the direct result of the authors' experience in the field of pesticide analysis. The book is structured in six chapters, starting from general aspects of pesticides like usage, physicochemical parameters and occurrence in the environment. A second chapter is devoted to sampling from water matrices, stability methods of pesticides in water and quality assurance issues. The general chromatographic methods for pesticides are reported, including the newly developed electrophoresis methods and GC-MS and LC-MS confirmatory analytical methods. Sample preparation methodologies, including off-line and on-line techniques are described in the next two chapters, with a comprehensive list of examples of pesticides and many metabolites, including the use of different GC-methods and LC-methods. The final chapter is devoted to the development of biological techniques, immunoassays and biosensors, for the trace determination of pesticides in water samples. The book answers one of the key problems in pesticide analysis: the diversity of chemical functional groups, with varying polarity and physicochemical properties. Pesticides and their metabolites have received particular attention during the last few years in environmental trace-organic analysis. For instance, in the case of groundwater, the use of pesticides has become a cause for concern. Under the right conditions, pesticides, such as fertilizer nitrogen, can move through the soil into groundwater, a phenomenon once thought improbable. The movement of agrochemicals in surface water flow can be, in some instances, a major problem, specially in the case of water soluble pesticides that are generally transported to estuarine and coastal waters. Estuarine waters feature gradients of both pollutant concentrations and physicochemical characteristics such as salinity, turbidity and pH, and all these parameters must be carefully considered when developing methods of analysis for trace organics in estuarine waters. One of the key parameters in analytical determination is the environmental sampling. Different protocols and devices are needed for sampling sea-water samples - usually using large sample volumes of more than 50 litres either with LLE or SPE, with the problems encountered due to dissolved and particulate matter - which is different from drinking water and well water sampling. The representativeness of the sampling is also of concern. The sample preparation of organic compounds from water matrices has been recognized to be a bottleneck and it has been traditionally neglected in the literature. We should comment following R.W. Frie's ideas - that the most sophisticated hardware is useless if the chemistry in the protocol does not work. During the last few years new adsorbents have appeared - carbon type, polymeric sorbents with high capacity and immunosorbents - which can more efficiently trap the more polar compounds. The development of advanced automation methods based, usually on solid phase extraction techniques - PROSPEKT, OSP-2 and ASPEC XL - are examples of commercially available equipment that are of growing importance. These systems are generally coupled to LC and GC techniques. Sampling and sample handling can not be regarded as separate techniques in the analytical process and both should be integrated into the whole analytical determination. For this reason, validation and confirmation methods, such as mass spectrometry, either GC-MS and/or LC-MS, are needed. These serve to check the quality assurance of the developed method. The discussion between multiscreening versus specific methods of analysis and the influence of the matrix (ground-, surface- and estuarine-water), is also a point of concern due to the diversity of chemical classes within the compounds of study. That residues of pesticide and other "foreign" chemicals in food stuffs are of concern to everyone everywhere is amply attested by the reception accorded previous volumes of "Residue Reviews" and by the gratifying enthusiasm, sincerity, and efforts shown by all the individuals from whom manuscripts have been solicited. Despite much propaganda to the contrary, there can never be any serious question that pest-control chemicals and food-additive chemicals are essential to adequate food production, manufacture, marketing, and storage, yet without continuing surveillance and intelligent control some of those that persist in our foodstuffs could at times conceivably endanger the public health. Ensuring safety-in-use of these many chemicals is a dynamic challenge, for established ones are continually being displaced by newly developed ones more acceptable to food technologists, pharmacologists, toxicologists, and changing pest-control requirements in progressive food-producing economies. 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considered judgments of many individuals highly trained in a variety of complex biological, chemical, food technological, medical, pharmacological, and toxicological disciplines. The object of "Residue Reviews" is to provide concise, critical reviews of timely advances, philosophy, and significant areas of accomplished or needed endeavor in the total field of residues of pesticide and certain other chemicals in foods, feeds, and in transformed food products. During the 144th National Meetings of the American Chemical Society in Los Angeles, California the Pesticides Subdivision of the A.C.S. Division of Agricultural and Food Chemistry on April 1, 1963 sponsored a symposium "Instrumentation for the Detection and Determination of Pesticides and Their Residues in Foods". With special permission from R.N. HADER and his associates in the American Chemical Society, that symposium is reproduced in this volume of "Residue Reviews" because of its timeliness and significance to pesticide residue analysts everywhere. Without exception the symposium authors accepted my invitation to utilize "Residue Reviews" as their publication medium, and their cooperation in the extra chore of providing manuscripts conforming to the style requirements of "Residue Reviews" is gratefully acknowledged. Presiding over the two sessions of the symposium were CHARLES L. DUNN and MILTON S. SCHECHTER, whose introductory remarks at that time comprise the foreword to this volume; their enthusiastic assistance both in organizing the symposium and in achieving this final product is warmly appreciated. F.A.G. Production and use of pesticides - Toxic effects of pesticides - Short and long-term health effects of pesticides : epidemiological data - Populations at risk - Public health impact - Prevention of pesticide poisoning. Due to the heavy and expanding agricultural use of neurotoxic pesticides suspected to affect dopaminergic neurons, it is imperative to closely examine the role of pesticides in the development of Parkinson's disease (PD). We recruited 357 incident PD cases and 752 population-based controls from 2000-2010 in the Central Valley of California and collected demographic, covariate, as well as residential and occupational address information. We utilized a geographic information system (GIS)-based exposure assessment tool to estimate historical ambient exposure to agricultural pesticides at residential and occupational addresses. Combined exposure to ziram, maneb, and paraquat at workplaces increased risk of PD three-fold and combined exposure to ziram and paraquat, excluding maneb exposure, was associated with an 80% increase in risk. Risk estimates for ambient workplace exposure were greater than exposures at residences and were especially high for younger onset PD patients and when exposed in both locations. We estimated a greater than two-fold increase in risk of developing PD for participants exposed to organophosphates, organochlorines, dithiocarbamates, and paraquat individually after adjusting for covariates. However after adjusting for other pesticides, only ambient exposure to organophosphates remained strongly associated, suggesting that pesticides from other classes have a high degree of co-exposure and may require combined exposure to affect PD risk. Longer duration of exposure and co-exposure to a large number of pesticides within the same year were both associated with strong increases in PD risk. Ambient exposure to each organophosphate separately increased the risk of developing PD. However, it is difficult to estimate the risk associated with an individual pesticide due to the likelihood that participants were exposed to combinations of these pesticides rather than any one single pesticide. Combinations of organophosphates with mitochondrial disrupting properties exhibited larger risk increases and exposure-response patterns were observed with exposure to an increasing number of these chemicals. Taken together, our results provide support that ambient co-exposure to pesticides contributes to the etiology of PD. 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These matters are also of genuine concern to increasing numbers of governmental agencies and legislative bodies around the world, for some of these chemicals have resulted in a few mishaps from improper use. Adequate safety-in-use evaluations of any of these chemicals persisting into our foodstuffs are not simple matters, and they incorporate the considered judgments of many individuals highly trained in a variety of complex biological, chemical, food technological, medical, pharmacological, and toxicological disciplines. This book is a compilation of 29 chapters focused on: pesticides and food production, environmental effects of pesticides, and pesticides mobility, transport and fate. The first book section addresses the benefits of the pest control for crop protection and food supply increasing, and the associated risks of food contamination. The second book section is dedicated to the effects of pesticides on the non-target organisms and the environment such as: effects involving pollinators, effects on nutrient cycling in ecosystems, effects on soil erosion, structure and fertility, effects on water quality, and pesticides resistance development. The third book section furnishes numerous data contributing to the better understanding of the pesticides mobility, transport and fate. The addressed in this book issues should attract the public concern to support rational decisions to pesticides use. That residues of pesticide and other contaminants in the total environment are of concern to everyone everywhere is attested by the reception accorded previous volumes of "Residue Reviews" and by the gratifying enthusiasm, sincerity, and efforts shown by all the individuals from whom manuscripts have been solicited. 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Adequate safety-in-use evaluations of any of these chemicals persisting into our foodstuffs are not simple matters, and they incorporate the considered judgments of many individuals highly trained in a variety of complex biological, chemical, food technological, medical, pharmacological, and toxicological disciplines. Although concerns over the ecological impacts of pesticides gave rise to the environmental movement of the late 1960s and 1970s, since that time, pesticide use and its effects have been largely ignored by the law and by legal scholars. This book addresses this omission by providing a unique and serious treatment of the significance of pesticide issues in environmental law and takes an ecological perspective on the legal issues. Dealing with a wide range of questions relating to pests and pesticides, the book focuses primarily on agricultural pesticide use as the largest contaminator in the US. It also examines the legacy of past pesticide use and analyzes how recent developments in ecological science can inform the law and increase our understanding of ecology. Interdisciplinary in its approach, the book will be of interest to academics, lawyers, scientists and environmental and agricultural professionals. This book provides a critical overview of analytical methods used for the determination of pesticide residues and other contaminants in food and environmental samples by modern instrumental analysis. It contains up-to-date material including recent trends in sample preparation, general methods used for pesticide analysis and quality assurance aspects, and chromatographic and immunoassay methods. The rest of the book describes particular analytical methods used for the determination of pesticides in food and soil, water and air. In addition, the levels of these chemicals found in food, their regulatory aspects and the monitoring of pesticides in the environment are described. New Pesticides and Soil Sensors, a volume in the Nanotechnology in the Agri-Food Industry series, is a practical resource that demonstrates how nanotechnology is a highly attractive tool that offers new options for the formulation of 'nanopesticides'. Recent advances in nanopesticide research is reviewed and divided into several themes, including improvement of the water solubility of poorly soluble pesticide active ingredients to improve bioavailability and the encapsulation of pesticide active ingredients within permeable nanoparticles with the aim of releasing pesticide active ingredients in a controlled or targeted manner, while also protecting active ingredients from premature photo-degradation. Provides examples of pesticide formulations that contain inorganic and organic nanoparticles Includes general principles and the most recent applications of chemical sensors and multisensory systems for the assessment of soils and main soil nutrition component detection Presents the main benefits and drawbacks of chemical sensors and their employment in soil analysis for further applications Describes current issues of pesticide use, environmental contamination, bioaccumulation, and increases in pest resistance which demands a reduction in the quantity of pesticides applied for crop and stored product protection That residues of pesticide and other "foreign" chemicals in foodstuffs are of concern to everyone everywhere is amply attested by the reception accorded previous volumes of "Residue Reviews" and by the gratifying enthusiasm, sincerity, and efforts shown by all the individuals from whom manuscripts have been solicited. 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GAO noted that: (1) EPA has not carried out its congressional mandate to completely reassess the risks of all registered pesticides; (2) until EPA completes its reassessment, it cannot ensure that the public and the environment are protected from dangerous pesticides; (3) EPA registers pesticides and sets tolerances for food pesticide content; (4) after initial delays in the reassessment, Congress authorized EPA to determine the safety of pesticide chemicals, rather than individual pesticide products; (5) EPA reassessment efforts have included a telephone program to gather missing information on pesticide effects, an initiative to develop a regulatory position on each pesticide chemical, and an informal review process to review existing pesticide registrations in the face of new evidence regarding product safety; (6) EPA has only issued two final pesticide registrations; (7) EPA only recently began to assess the effects of pesticide inert ingredients; and (8) EPA resource limitations and the large volume of chemicals to be assessed could delay the reassessment effort's completion by more than 30 years. 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Since then, farmers have been using a growing list of insecticides, herbicides and fungicides to protect their crops. Their use has undoubtedly led to significant gains in agricultural production and reduction in disease transmission, but also to major problems: health concerns for both users of pesticides and the general public, the emergence of resistance in pest populations, and environmental problems. The book examines the development of legislation designed to control and restrict the use of pesticides, the emergence of Integrated Pest Management (IPM) and the use of biological control agents as part of policy to protect the environment and encourage the sustainable use of pesticides. Finally, the use of new technologies in pest control are discussed including the use of genetic modification, targeted pesticide application and use of drones, alongside basic requirements for IPM such as crop rotations, close seasons and adoption of plant varieties with resistance to pests and diseases. Worldwide concern in scientific, industrial, and governmental communities over traces of toxic chemicals in foodstuffs and in both abiotic and biotic environments has justified the present triumvirate of specialized publications in this field: comprehensive reviews, rapidly published progress reports, and archival documentations. These three publications are integrated and scheduled to provide in international communication the coherency essential for non-duplicative and current progress in a field as dynamic and complex as environmental contamination and toxicology. 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Current regulations are intended to protect the health of the general population by controlling pesticide use. This book explores whether the present regulatory approaches adequately protect infants and children, who may differ from adults in susceptibility and in dietary exposures to pesticide residues. The committee focuses on four major areas: Susceptibility: Are children more susceptible or less susceptible than adults to the effects of dietary exposure to pesticides? Exposure: What foods do infants and children eat, and which pesticides and how much of them are present in those foods? Is the current information on consumption and residues adequate to estimate exposure? Toxicity: Are toxicity tests in laboratory animals adequate to predict toxicity in human infants and children? Do the extent and type of toxicity of some chemicals vary by species and by age? Assessing risk: How is dietary exposure to pesticide residues associated with response? How can laboratory data on lifetime exposures of animals be used to derive meaningful estimates of risk to children? Does risk accumulate more rapidly during the early years of life? This book will be of interest to policymakers, administrators of research in the public and private sectors, toxicologists, pediatricians and other health professionals, and the pesticide industry. A guide to the diversity of pesticides used in modern agricultural practices, and the relevant social and environmental issues Pesticides in Crop Production offers an important resource that explores pesticide action in plants; pesticide metabolism in soil microbes, plants and animals; bioaccumulation of pesticides and sensitiveness of microbiome towards pesticides. The authors explore pesticide risk assessment, the development of pesticide resistance in pests, microbial remediation of pesticide intoxicated legumes and pesticide toxicity amelioration in plants by plant hormones. The authors include information on eco-friendly pest management. They review the impact of pesticides on soil microorganism, crops and other plants along with the impact on other organisms like aquatic fauna and terrestrial animals including human beings. The book also contains an analysis of pesticide by GC-MS/MS (Gas Chromatography tandem Mass Spectrometry) a reliable method for the quantification and confirmation of multiclass pesticide residues. This important book: Offers a comprehensive guide to the use of the diversity of pesticides and the pertinent social and environmental issues Explores the impact of pesticides from morphological, anatomical, physiological and biochemical perspectives Shows how pesticides affects soil microorganisms, crops and other plants along with the impact on other organisms like aquatic fauna and animals Critically examines whether chemical pesticides are boon or bane and whether they can be replaced by environmental friendly pesticides Written for students, researchers and professionals in agriculture, botany, entomology and biotechnology, Pesticides in Crop Production examines the effects of chemical pesticides and the feasibility of using bio-pesticides. This reference handbook provides fully updated chemical, regulatory, health, and safety information on nearly 800 pesticides and other agricultural chemicals. The clear, consistent and comprehensive presentation of information makes Sittig's an essential reference for a wide audience including first responders, environmental and industrial health/safety professionals, the food industry, the agricultural sector and toxicologists. Detailed profiles are provided for each substance listed, including: usage; crop-specific residue limits; hazard ratings for long-term human toxicity; and endocrine disruptor and reproductive toxicity information. Every chemical profile contains references and web links to source information from the EPA, OSHA, the World Health Organization (WHO), and other important advisory and lawmaking bodies. This work is focused on regulated chemicals. The substances covered include pesticides, insecticides, herbicides, fungicides, rodenticides and related agricultural chemicals used on foods grown and produced for both human and animal consumption. These products are organized with common names, chemical synonyms, trade names, chemical formulae, US EPA pesticide codes, EU regulations including Hazard Symbol and Risk Phrases, EINECS, RTECS, CAS, and other unique identifiers so that all who may have contact with, or interest in them can find needed information quickly. A comprehensive reference for the

agricultural sector, food industry, agrochemical manufacturing and distribution sector, and first responders Brings together a wealth of hazard and response, regulatory and toxicological information in one convenient go-to handbook Covers US, EU and worldwide regulatory requirements Residues of pesticides and other "foreign" chemicals in foodstuffs are of concern to everyone everywhere; they are essential to food production and manufacture, yet without surveillance and intelligent control some of those that persist could at times conceivably endanger the public health. The object of "Residue Reviews" is to provide concise, critical reviews of timely advances, philosophy, and significant areas of accomplished or needed endeavor in the total field of residues of these chemicals in foods, in feeds, and in transformed food products. These reviews are either general or specific, but properly they may lie in the domains of analytical chemistry and its methodology, biochemistry, human and animal medicine, legislation, pharmacology, physiology, regulation, and toxicology; certain affairs in the realm of food technology that are concerned specifically with pesticide and other food-additive problems are also appropriate subject matter. The justification for the preparation of any review for this book series is that it deals with some aspect of the many real problems arising from the presence of residues of foreign chemicals in foodstuffs. The scope of "Residue Reviews" is international. It encompasses those matters, in any country, which are involved in allowing pesticide and other plant-protecting chemicals to be used safely in producing, storing, and shipping crops. Added plant or animal pest-control chemicals or their metabolites that may persist into meat and other edible animal products (milk and milk products, eggs, etc. Crop protection continues to be an important component of modern farming to maintain food production to feed an expanding human population, but considerable changes have occurred in the regulation of pesticides in Europe in the last decade. The aim has been to reduce their impact on people and the environment. This has resulted in a major reduction in the number of chemicals approved for application on crops. In other parts of the world, a continuing expansion in the growing of genetically modified crops has also changed the pattern of pesticide use. In this second edition, Graham Matthews, updates how pesticides are registered and applied and the techniques used to mitigate their effects in the environment. Information on operator safety, protection of workers in crops treated with pesticides and spray drift affecting those who live in farming areas is also discussed. By bringing together the most recent research on pesticides in a single volume, this book provides a vital up to date resource for agricultural scientists, agronomists, plant scientists, plant pathologists, entomologists, environmental scientists, public health personnel, toxicologists and others working in the agrochemical industry and governments. It should assist development of improvements in harmonising regulation of pesticides in countries with limited resources for registration of pesticides. The object of "Residue Reviews" is to provide concise, critical reviews of timely advances, philosophy, and significant areas of accomplished or needed endeavor in the total field of residues of pesticide and certain other chemicals in foods, feeds, and in transformed food products. During the 144th National Meetings of the American Chemical Society in Los Angeles, California the Pesticides Subdivision of the A. C. S. Division of Agricultural and Food Chemistry on April 1, 1963 sponsored a symposium "Instrumentation for the Detection and Determination of Pesticides and Their Residues in Foods". With special permission from R. N. HADER and his associates in the American Chemical Society, that symposium is reproduced in this volume of "Residue Reviews" because of its timeliness and significance to pesticide residue analysts everywhere. Without exception the symposium authors accepted my invitation to utilize "Residue Reviews" as their publication medium, and their cooperation in the extra chore of providing manuscripts conforming to the style requirements of "Residue Reviews" is gratefully acknowledged. Presiding over the two sessions of the symposium were CHARLES L. DUNN and MILTON S. SCHECHTER, whose introductory remarks at that time comprise the foreword to this volume; their enthusiastic assistance both in organizing the symposium and in achieving this final product is warmly appreciated. F. A. G. This book brings together over 30 contributors with expertise in a variety of disciplines related to the topic. Although efforts continue toward reduction or elimination of pesticide chemicals in the management of pests in agriculture, public health and the urban arena, chemicals will continue to be one of the main weapons in control of insects, weeds, nematodes, plant diseases, etc. for some time to come. While considerable information is known about the acute toxicity of these compounds, information on the chronic effects from exposure to minute amounts of pesticide residues in food, water, air and soil is often very limited. This book approaches the topic from several different vantage points including pesticide epidemiology, new modes of action to minimize nontarget exposure, bioremediation of contaminated areas, molecular biology of the modes of action and detoxication of pesticides, and the dynamics of pesticide movement in the environment. As world leaders in the manufacture and use of pesticides, countries must cooperate in the search for safer pesticides with minimum chronic effects on humans and the environment. This book helps to remove the barriers of distance and language and should lead to new cooperative research efforts across country lines and discipline lines. Contents: Epidemiology of Pesticides Chronic Effects of Pesticides on Health Safer Insecticides Bioremediation of Pesticide Residues Biochemical and Molecular Biology of Pesticides Pesticide Ecology/Dynamics

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