

Preface

Whatever you do will be insignificant, but it is very important that you do it

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This book was initiated in 2009, in response to reports of wildlife mortality from field colleagues in India and Kenya that were tantamount to a distress signal. The unfortunate reality, however, is that carbofuran has been poisoning wildlife for the better part of 40 years. Here, we explore historic and very current incidents of wildlife mortality arising from both misuse (i.e., baiting and intentional poisoning), and legal applications of the compound, to crops. The distinction is very important because each issue elicits a certain response and requires a different approach; in the case of intentional misuse, manufacturers can and do argue that they provide instructions on the product label and that use in violation of these instructions (such as that detailed in Chapters 3 to 7) is outside their remit. In theory, the risks posed by some compounds can be minimised by cracking down on illegal use, by implementing proper management practice (which may include reducing a product's usage or concentration) or by adjusting use to take into consideration patterns of wildlife activity. In practice, the application of such mitigative measures can be far more challenging. Chapter 7 (Latin America) outlines field trials used to measure the effectiveness of mitigative measures (i.e., gustative repellants, colouration and camouflaging) in reducing the mortality of avian species during agricultural applications of carbofuran. Although in this particular case the camouflaging method offered effective protection, other mitigative measures investigated did not. It was noteworthy in this instance that the effectiveness of the gustative repellents was surpassed by the inherent toxicity of the compound. In other words, birds that ingested seeds treated with gustative repellents were poisoned before the repelling properties could even come into effect. In essence, carbofuran has the unpleasant distinction of being so hazardous to wildlife that it simply cannot be effectively regulated or managed accordingly without mortality. The case is made in Chapter 8 (which meticulously chronicles mortality in the United States and Canada arising from labelled usage) that the sole condition under which carbofuran can be safely applied is if an area is already entirely devoid of wildlife. This is why, over and beyond efforts to address alternative management practices, there has been such a strong movement to ban it.

Loss of livelihood or basic sustenance, and the decimation of wildlife species, many of them emblematic and heavily tied to biological richness or tourism potential, all understandably bring out powerful emotions in people. Cultural, socioeconomic and political factors further cloud the use and misuse of carbofuran. To facilitate navigation through such issues, a key objective of this book was to clearly lay out the incontrovertible facts about carbofuran, namely, its chemistry, mode of action, environmental fate, the analytical methods used to detect it (all covered in Chapter 1), the farming, agricultural practices and crops on which it is applied, and some of the laws and regulatory mechanisms in place regarding it, from country to country.

A substantial body of sound analytical evidence has been gathered in the United Kingdom (Chapter 6) and in the United States and Canada (Chapter 8). However, the reader will note the difficulties that even these 'developed' countries have had when it comes to reining in the use of carbofuran. Such

countries have fought to ban carbofuran for decades despite having firm regulations and seemingly irrefutable mortality evidence. Less 'developed' parts of the world continue to struggle to gather the most basic forensic data, to record and report the anecdotal evidence, and try to assemble their case against the continued use of carbofuran. In recognition that not all countries are on an even footing in terms of having the resources and capacity required to meet this challenge, another objective of this book was to consolidate the cumulative body of work available in the hope that this would help support current initiatives and catalyse further research. Such information also effectively illustrates the extent of the resources needed, and the magnitude of the task at hand. In response to this, royalties received from the book will go into a research fund established to further develop the contaminants monitoring and detection system in Kenya.

To provide a balanced perspective, the relative threat posed by other poisons and pesticides worldwide is also considered. In some regions, carbofuran emerges as one of the worst offenders whereas in others (for example in India, see Chapter 4), it is only one of many compounds used. In most of the cases presented in this book, population growth is at the root of the reported poisonings, by increasing competition between humans and wild animals for access to increasingly limited resources. 'Leisure-based' human-wildlife conflict, as a result of recreational hunting, is also described (see Chapter 6).

As a species, we are so often intolerant of others, and commonly very unwilling to share resources. However, poverty and hardship in less developed countries often leaves little space for compassion towards wildlife. Wild animals feed on crops to access what are, to them, readily available and abundant food sources. They may in turn damage property, in response to increasing encroachment on what is after all their habitat. Like humans, wildlife is running out of living space. As long as these conditions prevail, wildlife will continue to be persecuted, using whatever means are available.

The reader will note that in certain chapters, relatively few references have been cited, that the interval between referenced studies is patchy, or that few recent references are provided. Unfortunately, these discrepancies simply reflect the fact that little information has been amassed regarding wildlife poisoning incidents in that particular area or, that there are large temporal gaps between studies. Such issues are highlighted where appropriate. Many key documents and references came to light during the consultation for, and assembly of, this book. A list of seminal references and analytical protocols not included in this book can be obtained from the editor, via the publisher. A more technical discussion regarding the chemistry and fate of carbofuran in tropical soils is also available upon request. Readers are encouraged to contact the editor if they encounter any difficulties in accessing references mentioned within the book. The editor would also like to draw attention to the lack of material available for much of Asia, especially for Pakistan, China and Thailand. These are important areas for which we were only able to obtain limited information. Colleagues with information regarding these geographical zones, or those wishing to share any new information not already covered in this book, are invited to contact the editor so that these can be collated separately for dissemination.

Above all, the editor wished to give those who have witnessed animals succumbing to poisoning without being able to stop it and those whose best efforts have been undermined, the chance to voice their profound frustration, anguish and sense of helplessness. The hope is that individuals will draw some strength from the work of others which is often going on in parallel, without their knowledge. During a discussion in Nairobi in the spring of 2010, a friend and colleague (Martin Odino, co-author of Chapter 3) described conservation as a 'sad profession, the science of tremendous loss in the face of short-term gain'. Given the importance of any reprieve achieved, no matter how small or short-lived, we must persevere. Considering the magnitude of the loss in biodiversity already sustained (or looming), we can do nothing else. However, we can move forward with hope, in support of the tenacity shown by the people right in the midst of such issues, as exemplified by those who have contributed to this book. Here, we have tried to provide the best available science to illustrate the risks posed by carbofuran to wildlife worldwide, whether from abuse, misuse or legal practice. As for the future of this insidious compound and the steps that will follow, the reader must carefully consider the evidence and exercise his or her own judgement.