

PREFACE

The plant hormone ethylene was perhaps the first to be determined as a naturally occurring growth regulator in plant tissues, after the original observation that ethylene can directly influence plant development (Neljubov, 1901; see Chapter 1). Further, it is also the plant hormone for which the first significant evidence of receptors, and ensuing evidence of downstream signalling, was established.

To deal with the many aspects of ethylene biology in plants, this volume is divided (informally) into three parts, after a conspectus of the topic presented as Chapter 1. Part One deals with the biosynthesis of the hormone with three chapters covering the biosynthesis of *S*-adenosylmethionine (SAM), the biosynthesis of 1-amino-cyclopropane-1-carboxylic acid (ACC) (and discussion of competition with the polyamine pathway) and the oxidation of ACC (including the conjugation of ACC and the removal of HCN from plant tissues). For each chapter, the control of the pathway at the transcriptional, translational and post-translational levels is emphasized.

Part Two deals with ethylene signalling comprising three separate chapters on the receptors, the CTR-like and the downstream mitogen-activated protein (MAP) kinases, and finally the EIN2/EIN3 interactions and events in the nucleus. Again, at each level, the genetic and biochemical evidence is combined and dissected.

Part Three deals with the hormone as a growth regulator, with chapters covering ethylene and seed germination, ethylene and tissue growth (roots and shoots), ethylene and cell separation, ethylene and fruit ripening, ethylene and senescent processes (including floral events) and finally, ethylene and plant-pathogen interactions. A key aspect of these chapters is the discussion of evidence for the hormone as a primary regulator, and also ethylene as a participant in hormonal crosstalk. In these chapters too, some account of ethylene and post-harvest biology is covered, particularly in Chapters 11 and 12. In this volume, there is not a chapter devoted specifically to ethylene and environmental stress. Instead, these topics are treated separately in each chapter, as appropriate.

Finally, as the Editor of this volume I wish to thank the series of anonymous reviewers who generously made time to review each of the chapters. The secretarial assistance of Mrs Ann Truter is also gratefully acknowledged.

Michael T. McManus