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Preface

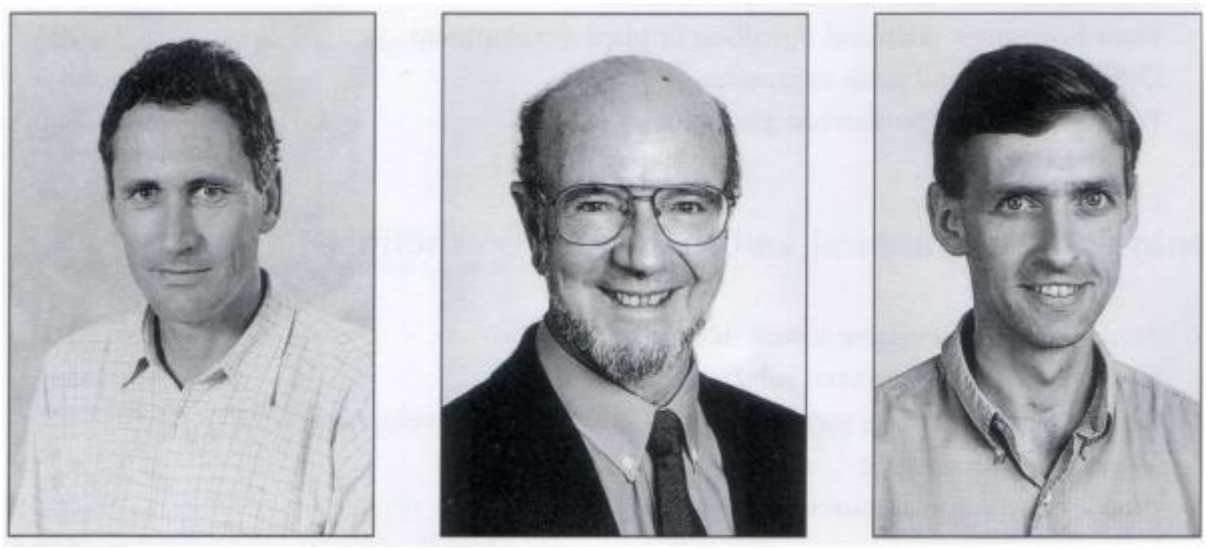
Plants in Action has been a collective effort by members of plant science societies in Australia and New Zealand. Our text is aimed at upper level undergraduate students in universities, colleges and technical institutes that teach in areas such as plant and environmental sciences, agriculture, horticulture and forestry. Postgraduate students and professionals will also find useful reference material in this textbook.

Plants in Action builds on a working knowledge of basic plant biology that students can glean from many fine texts available worldwide. Given such grounding, our broad aim in this text is to emphasise the practical relevance of plants in a modern world as crucial elements of all ecosystems and food chains; hence our subtitle Adaptation in Nature, Performance in Cultivation.
Plants in Action has a conspicuously Australasian flavour, drawing on examples from the multifarious natural and managed ecosystems that distinguish our region from the higher latitudes of North America and Europe. This journey through plant biology reveals special features of our post—Gondwanan flora, as well as principles that apply universally within plant science. Our narrative is built on credible experiments and is richly illustrated with original data. Numerous vignettes provide a human background to new knowledge that is readily transparent and structured for easy ‘grazing’.

Within this textbook, one key theme has been used to lend coherence across specialised contributions from over one hundred authors; namely **genotype by environment interaction**. This theme refers to an endless interplay between internal and external factors that drive every facet of any plant’s existence. For example, in the short term, as during a cycle of growth and reproductive development, environment shapes expression of genetic potential. By contrast, over the longer term of species or ecotype evolution, environmental conditions represent an unrelenting selection pressure for adaptation via shifts in genetic makeup. Taken overall, a continuing interaction.
Such fundamental interrelations underpin our treatment of processes and applications in plant physiology: **processes** in the sense that physiologists attempt to define the genetically determined workings of plants that enable them to occupy a given niche in nature; **applications** in the sense that commercial utility comes from genome enrichment and a successful match of genotype to habitat. Knowing which traits to develop for practical applications, and which genes to target for improved performance, continues to be a major challenge for plant physiologists. Plants in Action addresses this challenge.

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