

# Preface

Water deficit is the major cause of crop yield loss in virtually all areas of the globe that are not irrigated. Until very recently, there has been little progress in improving specific physiological traits in crop plants to decrease the impact of drought on yield. Two physiological traits have been recently identified that result in early-season, limited water use so that more water is available to support later-season reproductive growth. These water-conservation traits are early, partial stomata closure with soil drying and partial stomata closure under elevated vapor pressure deficit. This book reviews the mechanistic activity of both of these traits.

The initial chapters (Chaps. 1, 2, and 3) present the physiological basis of each of the water-conservation traits. These chapters provide readers with a full introduction and description of the functioning of these traits to result in putative yield increases. The remainder of the book (Chaps. 4, 5, 6, 7, 8, 9, 10, and 11) is devoted to reviews of the research on the two water-conservation traits in individual crop species. An important part of the reviews is the progress in understanding the traits so that they can be developed in each species leading to improved, higher-yielding cultivars. Commercial cultivars are already on the market for maize and soybean resulting in yield increase under water-deficit conditions. The progress in developing the water-conservation trait presented in this book would be of interest to all that are concerned about increasing future crop yields as water deficits are anticipated to become more prevalent.

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Water-deficit Environments

Case Studies

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