Plant Physiology Welcomes Its New Topical Reviews

For over two decades now, Plant Physiology has published a small number of shorter review articles each year. As their name implies, these Updates have dealt with recent developments within the plant sciences, generally addressing specific and timely questions of research endeavor. They were conceived initially as teaching tools but, in the more recent Focus Issue collections, have evolved additionally to encompass critical resources for researchers active within the field. Plant Physiology will continue to foster the Update series. In the coming months, we will be publishing a thought-provoking Update on the viral evolution of K⁺ channels and Focus Issues on Calcium Signaling and Encoding, on Water, and on Plant Roots. Plant Physiology also publishes the Founders Reviews, which my predecessor, Don Ort, introduced in 2010. The Founders Reviews highlight the work of preeminent scientists; they provide in-depth perspectives on their research, historical and contemporary context of the research, and the contributions of the research to the development of a fundamental understanding of plants. As with the Updates, Plant Physiology will continue these outstanding reviews, and I look forward to their appearance in the coming years.

With this issue of Plant Physiology, I am delighted to introduce the first in a new series of Topical Reviews that will appear at intervals in the journal. These reviews bridge the gap between the Updates and Founders Reviews, both in format and content. Topical Reviews are intended to provide experts and nonexperts alike with the background to research of exceptional and contemporary importance in plant biology. They will provide readers with essential conceptual and technical understanding behind the topic, encompassing a critical appraisal of the current situation, in-depth coverage of the backdrop to its achievement, and foresight into its future directions and promise. The two Topical Reviews within this issue of Plant Physiology fulfill these expectations and much more. The article “Improving Photosynthesis,” authored by John Evans, provides a reasoned overview of research into the complex traits that challenge efforts to improve photosynthetic yield. His analyses of carboxylation kinetics and light usage are presented in an innovative context and go well beyond coverage of the topic in several recent critiques. There is an elegant counterpoint here, too, in the back-to-back Topical Review of Hannes Claey and Dirk Inzé (“The Agony of Choice: How Plants Balance Growth” and “Survival under Water-Limiting Conditions”). Claey and Inzé offer a timely and comprehensive exploration of our understanding of plant survival in the face of this most fundamental abiotic stress. They highlight the challenges of dichotomy between studies of short-term, and often severe, drought stress and growth under long-term water deficits relevant to plants in the field. Claey and Inzé broaden and define the many facets of drought stress, rightly noting that the agony of choice is “not limited to plants, but also extends to us.” Both reviews are eminently readable and thoughtfully compelling. I hope you will find them as stimulating as I have.

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