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ON THE COVER



Tocopherols (vitamin E) have long been assumed to play essential roles in protecting plants from oxidative stress. Maeda et al. (pages 2710–2732) analyzed a series of *Arabidopsis* vitamin E (*vte*) biosynthetic mutants. Surprisingly, only minor differences were observed between a tocopherol-deficient *vte2* mutant and the wild type during high-intensity light, salinity, and drought stresses. By contrast, *vte* mutants exhibited dramatic phenotypes in response to nonfreezing low temperatures, independently of any photoprotective functions of tocopherols. Further analysis suggested that the mutants were defective in phloem loading capacity. The study indicates that tocopherols play a more limited role in photoprotection than previously assumed but play a crucial role in low-temperature adaptation and phloem loading. The cover shows a false colored image of phloem ultrastructure from cold-treated *vte2* overlaid with a leaf stained with aniline blue for callose visualization. The mutant exhibits dramatic ultrastructural changes exclusively in phloem parenchyma transfer cells, a bottleneck of photo-assimilate export. Cover image by Tammy L. Sage.

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[W](#) Online version contains Web-only data.

[OA](#) Open Access articles can be viewed online without a subscription.



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