Cover Stories:

Major Scientific Publications Featuring NRI-Funded Research

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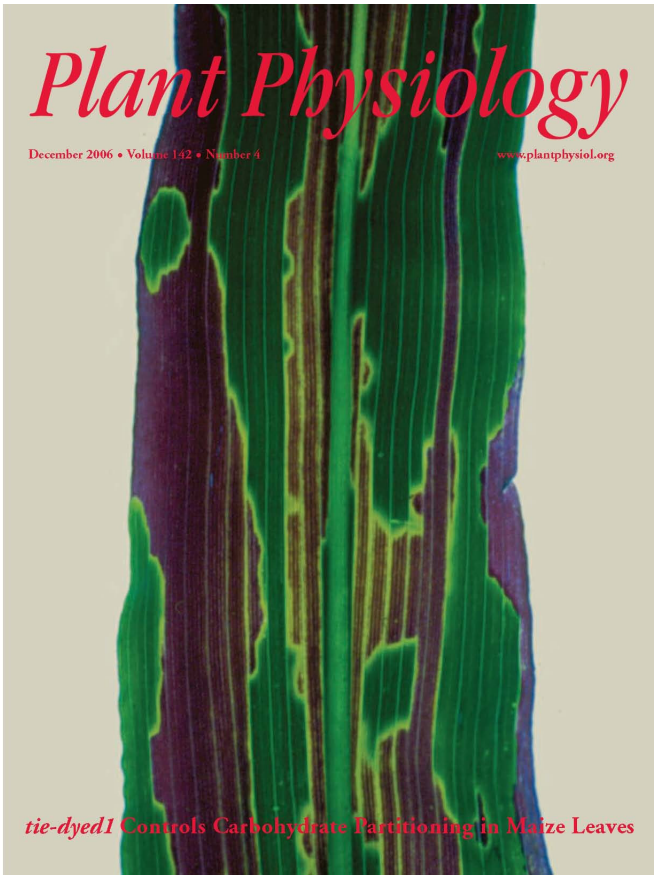

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Braun, D.M., Y. Ma, N. Inada, M. G. Muszynski, and R. F. Baker, 2006, *tie-dyed1*Regulates Carbohydrate Accumulation in Maize Leaves, *Plant Physiology*, 142 (4), 1511-1522.

Plants harvest the energy in sunlight to synthesize sugars in their leaves. These sugars are exported to non-photosynthetic plant parts, such as fruits and seeds, to promote growth. Determining how plants partition these sugars is critical in order to understand plant growth, which underlies crop yield. Researchers identified a gene in corn, called *tie-dyed1 (*TDY1*)*, which controls sugar accumulation in leaves. The absence of the TDY1 gene product in a plant produces a mottled or variegated appearance, because the sugars are not partitioned appropriately in the leaf. The journal cover image illustrates how plants lacking the *Tdy1* gene fail to properly export sugars, and develop regions that accumulate excess sugars (indicated by the purple color). The accumulated sugars remain in the leaves and are not partitioned to other parts of the plant limiting their growth and reducing plant yield.

The recent national interest in biofuels is driving scientists to explore new ways to enhance plant growth in an effort to make the idea of biofuels a reality. Understanding the mechanisms by which TDY1 regulates carbon distribution will allow scientists to modify plant growth patterns by promoting or restricting the flow of sugars to particular plant organs. This may lead to novel applications to enhance yield and increase biomass for biofuels production.

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