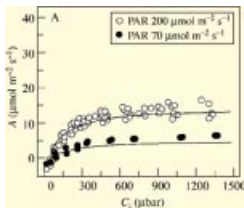


# ContentSnapshots



## Proteins of plant storage tubers

Edible tubers of five crops (cassava, potato, sweet potato, yams and taro) are major sources of carbohydrate and protein for humans and livestock. **Shewry (pp. 755–769)** discusses the structures and biological activities of the storage proteins present in these species, including their wider relationships and common properties.



## Coupled model of photosynthesis, stomatal conductance and transpiration

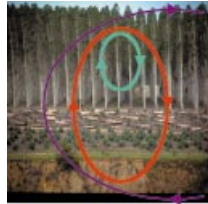
Three separate models have been combined by **Kim and Lieth (pp. 771–781)** to predict photosynthesis, stomatal conductance and transpiration of a rose leaf and to compare it with actual performance. The model accurately predicted net photosynthesis while slightly underestimating transpiration and stomatal conductances. The combined model should help glasshouse managers make appropriate environmental control decisions.



## High light tolerance requires antioxidants

Acclimation to high irradiances is an important requirement for plants living in variable environments. **Burritt and MacKenzie (pp. 783–794)** examine this phenomenon in *Begonia × erythrophylla*, a shade-requiring plant, after transfer to

full sunlight. The authors establish an important role for antioxidant metabolism.



## Nutrient dynamics throughout the rotation of Eucalyptus stands

Short rotation silviculture of *Eucalyptus* is practiced in Congo. **Laclau et al. (pp. 879–892)** demonstrate that intense nutrient recycling processes take place between canopy closure and harvest, indicating that small pools of nutrients circulate quickly in the ecosystem, making fast biomass production possible despite the paucity of mineral nutrients in the soil.



## Leaf mass per area (LMA) and plant growth at elevated CO2

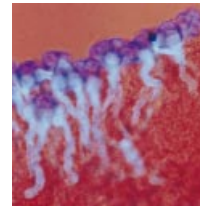
CO<sub>2</sub> elevation increases LMA with little effect on leaf mass ratio. Using the sensitivity analysis of a steady-state growth model, **Ishizaki et al. (pp. 905–914)** show that this response benefits the plant by increasing net assimilation rate even though it decreases leaf area ratio.



## Dynamics of size structure in maize, sunflower and soybean

In plant populations, interactions among individuals and plant-to-plant variation increase with ontogeny and density. Using a non-destructive method, **Vega and Sadras (pp. 795–805)** analyse the

development of size inequality in three crop species. Emphasis is placed on the links between patterns of size-dependent growth (i.e. linear or curvilinear) and the type of emerging size structure (normal, asymmetrical or bimodal).



## Self-sterility in angiosperms

**Sage and Sampson (pp. 807–816)** show that self-sterility in a relictual angiosperm is not due to self-incompatibility reactions that result in self pollen tube rejection at the nucellus, as previously hypothesized. Rather, double fertilization occurs following self-pollination. Mechanisms of self-sterility are discussed in the context of pre-zygotic self-incompatibility reactions in pollen tube transmitting tissue vs. early-acting inbreeding depression.



## Cotton responses to UV-B radiation

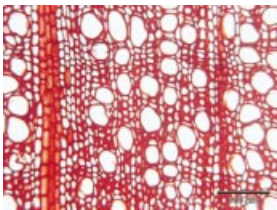
A high dose of UV-B radiation (16 kJ) is shown by **Kakani et al. (pp. 817–826)** to modify overall cotton growth, while a near-ambient dose of 8 kJ is sufficient to modify reproductive parameters. Typical symptoms of UV-B exposure are shown to include chlorosis and necrosis, more epidermal wax deposition, larger palisade layers, smaller and thinner leaves, and smaller flowers with fewer anthers.

*Continued overleaf*



### New evidence of late-acting self-incompatibility in Bignoniaceae

Histological analysis of post-pollination events is a powerful tool to distinguish between early-acting inbreeding depression and late-acting self-incompatibility. **Bittencourt et al.** (pp. 827–834) studied the histology of ovules from self- vs. cross-pollinated pistils and conclude that late-acting self-incompatibility based on premature flower abscission is the best explanation for self-sterility in *Spathodea campanulata*.



### Wood anatomy of epacrids

The wood structure of 16 epacrid genera (Styphelioideae, Ericaceae *s.l.*) is investigated by **Lens et al.** (pp. 835–856) who discuss the results in terms of molecular phylogenetics. The findings demonstrate that several anatomical features of the wood are consistent at the tribal level. These features also illustrate certain evolutionary trends and help to evaluate the impact of ecological conditions on wood structure.



### Water relations and kernel weight in maize

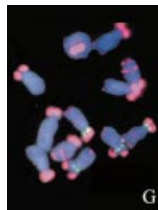
Even though kernel number per unit land area is the most important yield component in maize, variations in kernel weight also have an impact on yield. Accordingly, **Borrás et al.** (pp. 857–867) assess the extent to which variations in maize kernel weight caused by post-

flowering source–sink treatments are mediated by a change in kernel water relations.



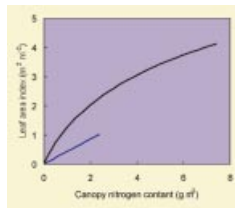
### Radiation use efficiency of leaves and canopy

It has been proposed that photosynthetic radiation use efficiency is constant for leaves throughout a canopy. **Rosati and DeJong** (pp. 869–877) confirm this hypothesis by modelling leaf photosynthesis with field-measured incident light and photosynthetic properties of individual leaves. They suggest that radiation use efficiency is constant for both clear and overcast days, and can be estimated in a simple way.



### Karyotype analysis in Vicia

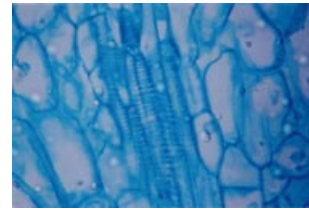
The genus *Vicia* includes species that differ up to 7.5-fold in their nuclear DNA content. This makes *Vicia* a good model to study plant genome and karyotype evolution. **Navrátilová et al.** (pp. 921–926) examine karyotypes of four *Vicia* species with respect to localization of five families of tandem repeats. The results show considerable divergence even between closely related species.



### Crop canopy nitrogen and leaf area index

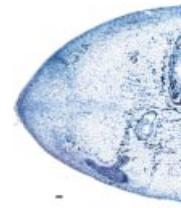
In many crop growth simulation models, leaf area index is often predicted from available carbon for leaf growth with

little attention being paid to its response to nitrogen. The quantitative analysis presented by **Yin et al.** (pp. 893–903) shows that the relationship between leaf area index and canopy nitrogen content is linear for young canopies and logarithmic for established canopies. This finding, combined with the existing carbon-based approach, promises a robust model for predicting a temporal course of crop leaf area index under the framework of carbon–nitrogen interaction.



### Jasmonic acid changes the morphology of potato stolons

Formation of potato tubers at the tips of stolons comprises morphological development of the tuber in addition to biochemical changes resulting in the formation and storage of starch. **Cenzano et al.** (pp. 915–919) show that jasmonic acid enlarges the meristems, increases cell expansion, reduces leaf primordia length and causes early differentiation of vascular tissue.



### Unusual meristematic and developmental features of Cladopus roots

Roots of plants of the Podostemaceae, such as *Cladopus*, typically adhere to rocks in riparian environments and exhibit considerable morphological diversity. **Koi and Kato** (pp. 927–937) show that the broad ribbon-like roots have an apical meristem and, additionally, a long marginal meristem characteristic of a foliose root. In contrast to endogenous branching in other angiosperms, *Cladopus* lateral roots originate both endogenously and exogenously.