

Changes in cell wall pectin associated with potato periderm maturation

Susceptibility of potato tubers to periderm abrasion is a serious agricultural problem. **Sabba and Lulai (pp. 1–10)** show that resistance of potato periderm to abrasion is associated with an increase in the thickness of phellogen radial walls which is accompanied by an increase in unesterified pectin.



Photosynthetic ability of somatic embryos

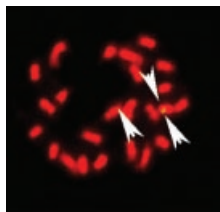
The photosynthetic ability of different stages in the development of coffee somatic embryos is studied by **Afreen et al. (pp. 11–19)** in relation to the development of stomata, CO₂ fixation or production rate, chlorophyll content and chlorophyll fluorescence. The cotyledonary stage is the earliest stage that can be cultured photoautotrophically.



Development of a bioreactor for the photoautotrophic culture of somatic embryos

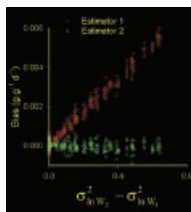
A culture system for coffee somatic embryos is described by **Afreen et al. (pp. 21–29)**. Two essential features are a temporary root-zone immersion bioreactor and a flow of sterile CO₂-enriched air. The set-up grows viable somatic embryos

that are vigorous, photoautotrophic and produced in large numbers.



Link between transgene location and activity

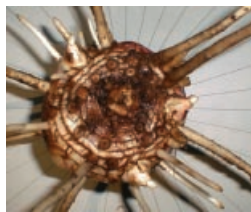
Using FISH mRNA *in situ* hybridization and ELISA, **Jin et al. (pp. 31–36)** analysed nine transgenic rice lines in the F₃ generation that carried the *CryIA [b]* gene. The expression level varied considerably. Although integration sites in the genome were heterogeneously distributed, no link was found between transgene location and its level of expression.



Avoiding bias in calculations of relative growth rate

Relative growth rate (RGR) is the principal measure used to quantify the growth of seedlings in experimental studies.

Hoffmann and Poorter (pp. 37–41) examine the performance of two commonly used estimators of RGR, demonstrating that one yields biased results, while the other is unbiased.

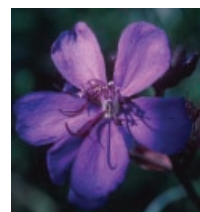


Primary root system in *Musa*

Shoot and root development are shown by **Lecompte et al. (pp. 43–51)** to be closely coordinated in young banana trees.

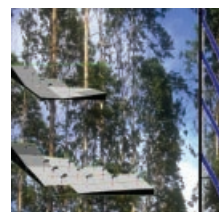
Quantitative information on primary root development is given based on root emergence kinetics and positions. Root

diameter is shown to increase both with root position and root ageing. Roots emerge principally in a horizontal direction.



Aluminium accumulation in Melastomataceae

Many plants within the order Myrtales show high concentrations of Al in their leaves. The evolutionary status of Al accumulators is explored by **Jansen et al. (pp. 53–64)** based on semi-quantitative analyses of Melastomataceae in particular. Al accumulators are generally woody, primitive plants from tropical areas and frequently show bluish-purple fruits or flowers.



Modelling the dynamics of nutrient concentrations within stemwood

Saint-André et al. (pp. 65–76) propose a generic model that was successfully applied to a eucalyptus hybrid. The biological significance of the parameters, formulation of the equation and identification of two successive stages (ring initiation and maturation) are discussed.

Continued overleaf



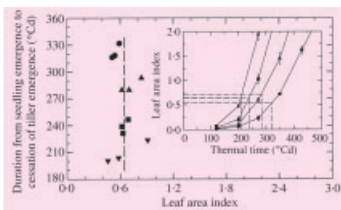
Ex vitro regeneration improves the quality of somatic embryo derived-plantlets

The quality of coffee plantlets is found by **Barry-Etienne et al. (77–85)** to be much higher if somatic embryos generated in a bioreactor are sown *ex vitro* on a horticultural soil rather than on semi-solid media *in vitro*. The resulting morphological, mineral and hydration characteristics are similar to those of conventional seedlings.



Sorghum tiller emergence and fertility

Early determinants of subsequent tiller fertility are expected to predict yield accurately. **Lafarge et al. (pp. 87–98)** observed that the same plant tiller hierarchy applied for emergence of tillers and for their subsequent fertility and grain number. This hierarchy was highly dependent on early tiller leaf area development and held for a wide range of plant densities.



Modelling the dynamics of tiller fertility in sorghum

Using results from extensive time-course sampling in the field, **Lafarge and Hammer (pp. 99–110)** identify quantitative relationships underpinning the divergence between the potential and realized leaf area. A model was developed linking this to the rate of decrease in infertile tillers.



Effect of temperature on chrysanthemum stem length

Temperature manipulation is widely used to regulate chrysanthemum stem elongation. However, it is not clear whether internode length is controlled by DIF (difference between day and night temperature) or by absolute day and night temperature. **Carvalho et al. (pp. 111–118)** identify the conditions where DIF explains internode length, and clarify the validity of the DIF concept.



Allocation to floral structures in a cryptically dioecious species

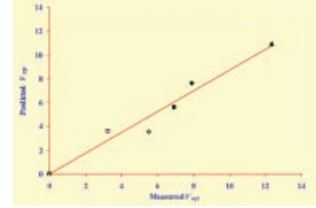
Females of *Thalictrum pubescens* produce stamens that contain sterile pollen, whereas males produce only stamens. **Davis (pp. 119–126)** examines female investment in stamen production by comparing female structures with their fully functional male counterparts. There was evidence of a trade-off within female flowers between the number of stamens and pistils.



UV-B effects on southern African plants

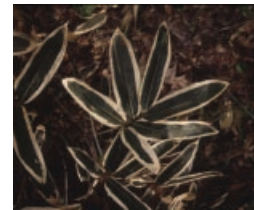
Effects of a 35 % increase in background ultraviolet-B radiation on 17 economically important herb, shrub and tree species were examined by **Musil et al. (pp. 127–137)**. Patterns of response to UV-B were unrelated to plant growth form, leaf thickness, flavonoid or starch content.

The great majority of species were insensitive to the UV-B increase. Exceptions included mopane and cowpea, both traditional sources of livelihood to rural African populations.



Modelling the regulation of nitrogen acquisition in legumes

A simple model for feedback regulation of nitrate uptake and N₂-fixation is presented by **Sousanna et al. (pp. 139–147)**. This provides a quasi-mechanistic simulation of phenotypic variation by white clover growing in flowing nutrient culture. The simple model has potential use as a sub-routine in larger models.



Silica accumulation in long-lived bamboo leaves

Motomura et al. (pp. 149–152) clarify the process of silica accumulation and its significance in the Poaceae. Leaves are shown to accumulate silica throughout their life. Accumulation is rapid during spring and summer, and slow in winter. The evidence indicates that the extent of silica accumulation is a result of the water uptake rate.