

The role of aquaporins in root water uptake

The identification of aquaporin water channels in root cell membranes has provided new insights into mechanisms of water uptake by plants. **Javot and Maurel (pp. 301–313)** discuss the possible involvement of aquaporins in developmental and environmental controls on the permeability of roots to water.



Nitrate uptake, nitrate reductase and proton release in legumes

Nitrogen form plays a key role in cation–anion relationships and hence in proton release by plant roots. **Fan et al. (pp. 315–323)** examine how nitrate supply affects its uptake, nitrate reductase activity (NRA) and net proton release in nodulated legumes. They show net proton release to be negatively correlated with nitrate uptake and NRA in shoots.



Respiration of pine crown under elevated CO₂ and temperature

Long-term acclimation to elevated CO₂ and temperature of respiration by the foliage in the crown of Scots pine trees is assessed by **Wang et al. (pp. 325–335)**. Changed respiration parameters for individual leaves made only a small contribution to the annual crown respiration compared with the increased total foliage area. Effects of changes in crown architecture and nitrogen distribution, caused

by treatments, on the daily and annual course of crown respiration are highlighted.



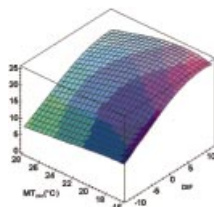
Cations ameliorate bisulfite effects in terricolous mosses

In the calcifuge moss *Pleurozium schreberi*, Fe³⁺ from underlying soil ameliorates inhibitory effects of bisulfite (dissolved SO₂) on photosynthesis, probably by passive oxidation. Ca²⁺ ions have no protective effect. However, **Bharali and Bates (pp. 337–343)** show that adsorbed Ca²⁺ strongly ameliorates bisulfite inhibition of photosynthesis in *Rhytidiadelphus triquetrus*, a moss restricted to calcareous soils in polluted regions.



DNA content in *Cistus*

Flow cytometry has been used by **Ellul et al. (pp. 345–351)** to estimate the nuclear DNA content and the proportion of A–T base pairs in 16 out of 19 species of the Mediterranean genus *Cistus*. These data now cover about 10 % of the Cistaceae, a poorly studied family for which only a single report of DNA C-value was previously available.



Modelling internode elongation in chrysanthemum

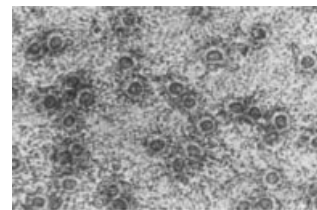
The DIF concept states that equal internode lengths can be achieved with the

same difference between day and night temperature irrespective of the mean 24 h temperature. **Schouten et al. (pp. 353–359)** show that three processes, integrated in a model, can be used to describe the physiological background to the DIF concept.



Sawgrass flower and spikelet morphology

The number, arrangement and sex of flowers in spikelets are important characters in sedge systematics but have been poorly described for sawgrass. **Richards (pp. 361–367)** reports the structure and phenology of spikelets from south Florida sawgrass populations and shows that the two-flowered spikelets are determinate. This is in contrast to current descriptions for all but the most primitive sedges.



Cytokinins and endosperm cell number in rice

Cytokinin concentrations in rice endosperm and roots together with cell division in endosperm are examined by **Yang et al. (pp. 369–377)**. They show that cell number and cell division in rice endosperm are regulated by cytokinins in the endosperm, and that root-derived zeatin and zeatin riboside may play a pivotal role.

Continued overleaf



Categorization of branching in *Trifolium repens*

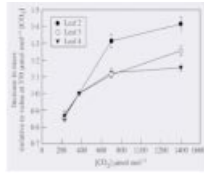
A developmentally based categorization of the stages of axillary bud and branch growth was developed to help assess the influence of nodal roots on shoot branching. **Thomas *et al.* (pp. 379–389)** show that restricting nodal root formation retards branching and is responsible for short root formation, a distinctive, newly described category of branching.



Natural and induced polyploidy in acacias

Acacias planted as exotic forestry species can be problematic because of a tendency to invade native woodland and cultivated areas. One possible solution is to plant triploid trees of low inherent fertility.

Blakesley *et al.* (pp. 391–398) examine the induction of polyploidy in two *Acacia* species, and report the natural occurrence of tetraploid and triploid *Acacia dealbata*.



CO₂ and translocation

Translocation of carbohydrates from leaves at night requires energy supplied by respiration. **Bunce (pp. 399–403)** reports that translocation from soybean leaves, as measured by mass balance, is sensitive to carbon dioxide concentration. Low night-time concentrations of carbon dioxide stimulate translocation and respiration, and high concentrations inhibit both processes.



Modelling asynchronous flowering

Flowering asynchrony between and within trees is widespread and has important consequences for the reproductive success of a population.

Normand *et al.* (pp. 405–415) propose a model to simulate the time course of flowering of a tree or a population, which takes flowering asynchrony between and within trees explicitly into account.



Hormones and syyleptic branching

Syyleptic branches grow out from buds immediately without overwintering. Although this is relatively rare in temperate woody species, it does occur in economically important hybrid poplar. **Cline and Dong-II (pp. 417–421)** present preliminary evidence of a correlation between differences in sensitivity to auxin and cytokinin and the degree of syyleptic branching.