

Root systems for dry environments

This issue of *Functional Plant Biology* features three novel papers on quantitative aspects of root systems. Palta *et al.* (2011) give a Viewpoint paper about the idea of ‘large root systems’ – what exactly does this phrase mean, and are large roots systems useful in adapting wheat to water-limited environments. A vigorous root system contributes to increasing the capture of water and nitrogen early in the season, and facilitates the capture of additional water for grain-filling. However, in environments where crops are reliant on stored soil water, a vigorous root system increases the risk of depleting soil water before completion of grain-filling.

Searching for useful genetic variation in root systems is a difficult and laborious process, so the method presented by Chen *et al.* (2011) for a novel ‘semi-hydroponic’ system is of particular interest. It was developed to provide an efficient phenotyping screen for studying root architecture in lupins. Root system responses to poor and rich patches of nitrate is described by Blouin and Puga-Freitas (2011), who studied root systems in combined gradients of contrast between poor and rich patches and of overall nitrate concentration in the environment.

Two papers highlight the importance of differential root system growth in maximising net plant assimilation and maintaining yield in dry environments. Partial rootzone drying and regulated deficit irrigation were studied in field-grown almond trees by Egea *et al.* (2011) and grapevines by Tarara *et al.* (2011). These studies show the benefits of deficit irrigation techniques in reducing the amount of water used and maximising plant productivity.

Change to ScholarOne

Functional Plant Biology changed to ScholarOne on 15 April 2011. New manuscript submissions will be directed to ScholarOne, and the authors of previous papers under review will be asked to change over when a revised manuscript is submitted. The new system is a delight, especially for Editors, who can see at a glance all the manuscripts they are handling. Authors and reviewers will be familiar with the system as it is being used by many plant science journals.

Special issue: 2nd plant phenomics conference

To exploit the wealth of gene sequence information provided by the ‘genomics revolution’ and to mine agricultural germplasm for genetic diversity, high resolution and high throughput technologies in plant physiology are required for bridging the gap between genotype and phenotype (Furbank 2009). Key papers from the first international conference on plant phenomics held in Canberra, Australia, in April 2009 were published in *Functional Plant Biology* later the same year. The 2009 special issue (<http://www.publish.csiro.au/nid/103/issue/5005.htm>) was devoted to plant phenomic approaches

to provide the quantitative phenotyping needed to screen germplasm for genetic variation in form, function and performance.

The 2nd International Phenomics Conference (see <http://www.plantphenomics.com/Juelich2011>) will take place this year in Jülich, Germany, and again *Functional Plant Biology* will publish a special issue of papers presented at the meeting. This upcoming conference recognises that plant phenotyping has emerged as a central field of research in academia and industry. A first challenge is establishing robust protocols and screening methods integrating non-invasive, automated quantification of structural and functional traits. Additional goals are achieving high-throughput and high-content information using appropriate experimental designs to establish links between controlled, semi-controlled and field scenarios.

Focusing on these themes and providing excellent networking opportunities between users and experts in technologies, the 2nd Plant Phenotyping Symposium will be held at the Forschungszentrum Jülich in 5–7 September 2011. Speakers are encouraged to present integrated views identifying perspectives and challenges, and prioritizing possible working solutions. There will be ample time in the program for interaction and discussion among speakers, poster presenters and other participants. In addition to invited speakers, submitted abstracts will be selected for short presentations. Registration is now open, and the deadline for abstracts is 15 June 2011 (<http://www.plantphenomics.com/Juelich2011>).

References

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