### Full program

#### Monday 5 October 2015

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00 pm – 4.00 pm</td>
<td>Registration</td>
<td>Foyer</td>
</tr>
<tr>
<td>3.30 pm – 4.30 pm</td>
<td>ISRR Committee meeting</td>
<td>Boardroom, Hotel Realm</td>
</tr>
<tr>
<td>5.30 pm – 7.30 pm</td>
<td>WELCOME RECEPTION Roots down under—or on top? John Passioura</td>
<td>National Gallery of Australia</td>
</tr>
</tbody>
</table>

#### Tuesday 6 October 2015

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.00 am</td>
<td>Registration open</td>
<td>Foyer</td>
</tr>
<tr>
<td>8.30 am – 8.55 am</td>
<td>Symposium opening: John Manners, CSIRO; James Clark, GRDC</td>
<td>Ballroom 3-4</td>
</tr>
<tr>
<td>8.55 am – 10.15 am</td>
<td>PLENARY SESSION 1 Roots responding to climate change SPONSOR: Bayer Crop Science</td>
<td>Ballroom 3-4</td>
</tr>
<tr>
<td>10.15 am – 12.25 pm</td>
<td>CONCURRENT SESSION 1 1A—Deep roots and root turnover Chairs: Tim Colmer and Cathrine Ingvordsen</td>
<td>Ballroom 3-4</td>
</tr>
<tr>
<td>10.45 am – 12.25 pm</td>
<td>CONCURRENT SESSION 1 1B—Root microbiome interactions Chairs: Uli Mathesius and Alberto Casartelli</td>
<td>Ballroom 2</td>
</tr>
<tr>
<td>12.30 pm – 1.30 pm</td>
<td>LUNCH</td>
<td>Foyer</td>
</tr>
<tr>
<td>1.30 pm – 3.15 pm</td>
<td>Poster Session 1 (Presenters—odd numbered posters)</td>
<td>High Courtyard</td>
</tr>
<tr>
<td>3.15 pm – 3.45 pm</td>
<td>AFTERNOON TEA</td>
<td>Foyer</td>
</tr>
</tbody>
</table>
### 3.45 pm – 5.10 pm  
**CONCURRENT SESSION 2**

<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Chair(s)</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>2A</td>
<td>Root water relations</td>
<td>Annie DesRochers and Stefan Hey</td>
<td>Ballroom 3-4</td>
</tr>
<tr>
<td>2B</td>
<td>Root endophytes</td>
<td>Hans Lambers and Daniel Sarabia-Lopez</td>
<td>Ballroom 2</td>
</tr>
<tr>
<td><strong>Keynote 05</strong></td>
<td>Rhizosphere processes affecting root water uptake: a review/point of view</td>
<td>Andrea Carminati</td>
<td></td>
</tr>
</tbody>
</table>

#### Paper Presentations
- **O-09** Water uptake of main root segments in a multiple compartment root container—Dagmar van Dusschoten
- **O-10** Long-term irrigation affects root growth and decomposition in a drought stressed Alpine Scots pine forest—Claude Herzog
- **O-11** Diurnal patterns of roots growth in grapevines—Kare Maihemuti
- **O-12** Complementary shifts in root-mycorrhizal networks and rhizobiome drive ecosystem adaptation in changing climate: experiments and gradient studies from northern forests—Ivika Ostonen
- **O-13** Endophytic *Trichoderma virens*: a close interaction with its host plant roots—Guillermo Nogueira Lopez
- **O-14** Drying up belowground: the role of root associated organisms in plant tolerance to the climate change drought—Alison Bennett

### 5.15 pm – 5.55 pm  
**PLENARY SESSION 2**  
**Roots and drought tolerance**  
SPONSOR: Journal of Experimental Botany  

<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Chair(s)</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Keynote 07</strong></td>
<td>Roots and crop adaptation to drought: moving forward from selection for deep roots</td>
<td>Amelia Henry</td>
<td>Ballroom 3-4</td>
</tr>
</tbody>
</table>

**5.55 pm**  
**NETWORKING DRINKS**
Wednesday 7 October 2015

8.00 am Registration open

8.30 am – 9.10 am
PLENARY SESSION 3
Genetics and functions of root hairs
SPONSOR: Grains Research and Development Corporation

Chairs: Peter Ryan, Jessica Mowle and Danny Dwi Saputra

Keynote 08
Development and evolution of land plant rooting systems: rhizoids to root hairs
— Liam Dolan

9.15 am – 10.15 am
CONCURRENT SESSION 3

3A—Genetics and functions of root hairs
Chairs: Peter Ryan, Jessica Mowle and Danny Dwi Saputra
Ballroom 3-4

O-15
Class 1 ARF-GAPs: regulatory hubs that link phosphoinositide signaling and the cytoskeleton in specifying root hair polarity—Elison Blancaflor

O-16
The genetics of rhizosheath size in a multiparent mapping population of wheat—Manny Delhaize

O-17
Understanding the biophysical formation and genetic control of the rhizosheath—Timothy George

O-18
Field evaluation of a 4H QTL for root rhizosheath weight in barley—Xue Gong

3B—Cell biology and water uptake
Chairs: Leslie Weston and Stephen Slack
Ballroom 2

O-19
Root growth under water deficit: ferulate crosslinks as restraints to cell wall extension—Hallie Thompson

O-20
Characterisation of a quantitative trait locus for increasing hydraulic conductance of rice—Tadashi Hirasawa

O-21
Root cortical senescence influences root radial water uptake in barley—Hannah Schneider

O-22
Characterisation of ‘drought rhizogenesis’ in rapeseed (Brassica napus): an exceptional drought tolerance mechanism—Juan Sergio Moroni

10.15 am – 10.45 am
MORNING TEA

10.45 am – 12.25 pm
CONCURRENT SESSION 4

4A—Root phenotyping and breeding targets
Chairs: Anton Wasson and Christina Clarke
Ballroom 3-4

Keynote 09
Rice root traits for enhanced nutrient capture: phenotyping techniques and their potential for successful breeding outcomes—Matthias Wissuwa

O-23
Recent development in root phenotyping pipelines of cereal crops: transparent soil and rhizotubes—Tracy Valentine

O-24
Root phenotyping of temperate cereals—a high throughput phenotyping pipeline for field experiments—Tobias Wojciechowski

O-25
Root phenotyping under semi-field conditions—understanding root growth and distribution—Dorte Bodin Dresbøll

O-26
Identifying critical root length density targets for effective subsoil water use by wheat—John Kirkegaard

4B—Membrane function and root signalling
Chairs: Manny Delhaize and Isaiah Pabuayon
Ballroom 2

Keynote 10
A co-operated transport system for mineral element uptake in rice roots—Jian Feng Ma

O-27
Cell-specific effects of oxygen availability and salinity on ion concentrations in adventitious roots of barley—Tim Colmer

O-28
Identifying novel salinity tolerance mechanisms by spatial analysis of lipids in barley roots—Ute Roessner

O-29
Sodium sequestration and salinity stress signalling in wheat roots—Sergey Shabala

O-30
The Arabidopsis nitrate transceptor NRT1.1/NPF6.3 that governs distinct signaling pathways is subjected to a complex post transcriptional regulation—Philippe Nacry

12.30 pm – 1.30 pm
LUNCH

1.30 pm – 6.00 pm
Mid-Symposium Tours
Tidbinbilla Nature Reserve
Houses of Parliament/Australian War Memorial and Floriade
Cool Climate Wines
National Botanic Gardens and Floriade
Ginninderra Experiment Field Station

6.00 pm – 7.00 pm
ISRR General Meeting

6.00 pm – 7.00 pm ISRR General Meeting

Ballroom 3-4
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.00 am</td>
<td>Registration open</td>
</tr>
<tr>
<td>8.30 am – 9.10 am</td>
<td><strong>PLENARY SESSION 4</strong>&lt;br&gt;Root architecture and plant nutrition</td>
</tr>
<tr>
<td></td>
<td>SPONSOR: Meat and Livestock Australia</td>
</tr>
<tr>
<td></td>
<td>Chairs: Richard Simpson, Florencia de Marotte and Sida Tesfaye Shiferaw</td>
</tr>
<tr>
<td>9.00 am</td>
<td>Keynote 11: Improving nitrogen and phosphorus efficiency through modifying root architecture and nodulation in soybean—Hong Liao</td>
</tr>
<tr>
<td>9.15 am – 10.15 am</td>
<td><strong>CONCURRENT SESSION 5</strong>&lt;br&gt;5A—Root architecture and plant nutrition</td>
</tr>
<tr>
<td></td>
<td>5B—Root modelling and image analysis</td>
</tr>
<tr>
<td></td>
<td>Chairs: Glyn Bengough and Mutez Ahmed</td>
</tr>
<tr>
<td></td>
<td>Ballroom 2</td>
</tr>
<tr>
<td></td>
<td>O-31 Understanding the response of maize root system to low-nitrogen stress—Guohua Mi</td>
</tr>
<tr>
<td></td>
<td>O-32 Root plasticity of wheat (Triticum aestivum L.) in phosphorus enriched bands—Sheikh Rabbi</td>
</tr>
<tr>
<td></td>
<td>O-33 Root responses to nutrient patches—trade-offs and constraints—Eric Visser</td>
</tr>
<tr>
<td></td>
<td>O-34 The effects of zinc deficiency on root development in rice—Amrit Kaur Nanda</td>
</tr>
<tr>
<td>10.15 am – 10.45 am</td>
<td><strong>MORNING TEA</strong></td>
</tr>
<tr>
<td>10.45 am – 12.25 pm</td>
<td><strong>CONCURRENT SESSION 6</strong>&lt;br&gt;6A—Root adaptation to nutrient stress</td>
</tr>
<tr>
<td></td>
<td>6B—Root processes for nutrients and competition</td>
</tr>
<tr>
<td></td>
<td>Chairs: Jack Christopher and Iti Rathi</td>
</tr>
<tr>
<td></td>
<td>Ballroom 2</td>
</tr>
<tr>
<td></td>
<td>Keynote 12: Root adaptations to soils with low fertility and toxicities—Idupulapati Rao</td>
</tr>
<tr>
<td></td>
<td>O-39 Length does not always matter—root traits and rhizosphere attributes determining phosphorus acquisition efficiency in field-grown maize genotypes—Philippe Hinsinger</td>
</tr>
<tr>
<td></td>
<td>O-40 Surface area of root hair cylinder: a major factor in P uptake and the critical P requirement of pasture legumes—Rebecca Haling</td>
</tr>
<tr>
<td></td>
<td>O-41 Genetic control and influence of wheat rhizosheath size on acid soils—Richard James</td>
</tr>
<tr>
<td></td>
<td>O-42 Mineral nutrition in <em>Campos rupestres</em> species—Anna Abrahao</td>
</tr>
<tr>
<td>12.30 pm – 1.30 pm</td>
<td><strong>LUNCH</strong></td>
</tr>
<tr>
<td>1.30 pm – 3.15 pm</td>
<td><strong>Poster Session 2</strong>&lt;br&gt;(Presenters—Even numbered posters)</td>
</tr>
<tr>
<td>3.15 pm – 3.45 pm</td>
<td><strong>AFTERNOON TEA</strong></td>
</tr>
<tr>
<td>3.45 pm – 5.10 pm</td>
<td>CONCURRENT SESSION 7</td>
</tr>
<tr>
<td>------------------</td>
<td>----------------------</td>
</tr>
</tbody>
</table>
| **7A—Regulation of root architecture and rootstocks**  
Chairs: Bob Sharp and Jie Liu  
**Ballroom 3-4**  
Keynote 14  
Developmental and functional responses of rice root system to soil water and nutrient conditions  
— Yoshiaki Inukai  
O-47  
Root and shoot coordination: programmable and self-organised architectural development of ryegrass  
— AJ Escobar-Gutierrez  
O-48  
Root clonal networks preserve genetic diversity in *Populus tremuloides* stands of eastern Canada  
— DesRochers  
O-49  
Reciprocal grafts of M.9, M.116 and M.27 apple rootstocks demonstrate that the scion affects root system architecture and dry-matter distribution  
— Peter Gregory |
| **7B—Root systems and water use**  
Chairs: Vincent Chochois and Cecile Richard  
**Ballroom 2**  
Keynote 15  
Farming systems context drives the value of deep roots in Australia— Julianne Lilley  
O-50  
The response of root turnover and longevity in field-grown grapevines to deficit irrigation or reduced winter rainfall— Everard Edwards  
O-51  
Deeper root systems in wheat grown in rainfed, temperate conditions: relationships with yield, canopy temperature and water use— Alan Severini  
O-52  
Measurements of water uptake of maize roots: insights for breeders— Mutez Ahmed |

| 6.30 pm – 11.30 pm | SYMPOSIUM DINNER  
Speaker: Dr Tony Fischer |
|------------------|------------------------|

National Arboretum  
Sponsor: The Crawford Fund
Friday 9 October 2015

8.00 am  Registration open  Foyer

8.30 am – 9.10 am  PLENARY SESSION 5  Root genetics and breeding  SPONSOR: Annals of Botany  Ballroom 3-4

Chairs: Greg Rebetzke, Celine Pradier and Dominik Skoneczny

Keynote 16
Uncovering key genes and networks regulating root growth using systems genetics—Wolfgang Busch

9.15 am – 10.15 am  CONCURRENT SESSION 8

8A—Root genetics and breeding
Chairs: Greg Rebetzke, Celine Pradier and Dominik Skoneczny
Ballroom 3-4

O-53  High throughput root screens are a proxy for field performance in Brassica napus and can be used to identify novel genetic loci—Cathy Thomas

O-54  A major QTL for narrow root angle provides yield advantage in barley—Hannah Robinson

O-55  Genetic control of nodal root angle in sorghum and its implications on drought adaptation—Vijaya Singh

O-56  Speed-breeding combined with rapid phenotyping to improve root adaptation to water-limited environments—Cecile Richard

8B—Root exudation and soil interactions
Chairs: Philippe Hinsinger and Ritika Chowdhary
Ballroom 2

O-57  Complementarity for soil phosphorus acquisition by intercropped barley and legume varieties with contrasting root biochemical and physiological responses to P deficiency—Courtney Giles

O-58  Effects of trophic relationships, soil type and P source (phytate versus mineral P) on root development and architecture of Pinus pinaster seedlings—Claude Plassard

O-59  Barley genotype-specific variations in root carbon deposition and soil organic matter mineralisation—Lumbani Mwafuilwa

O-56  Detection of biological nitrification inhibition in canola: implications for N cycling and soil fertility in rotational cropping—Cathryn O’Sullivan

10.15 am – 10.45 am  MORNING TEA  Foyer

10.45 am – 12.25 pm  CONCURRENT SESSION 9

9A—Roots and farming systems
Chairs: Mark Peoples and Anna Abrahao
Ballroom 3-4

Keynote 17  Root system-based limits to agricultural productivity and efficiency—the farming systems context—Kristian Thorup-Kristensen

O-61  High plasticity of wheat roots to soil N and water availability is conducive to higher competitive ability of wheat than maize in intercropping systems—Long Li

O-62  Reduced crown root number improves water acquisition under water deficit stress in maize—Yingzhi Gao

O-63  High-throughput, direct phenotyping of wheat roots in the field—Anton Wasson

O-64  Searching the roots: breeding phosphorus efficient sorghum for West Africa—Willmar Leiser

9B—Root development and growth
Chairs: Everard Edwards and Sabrina Chin
Ballroom 2

Keynote 18  Systems analysis of roots: bridging molecular, rhizosphere and field scales—Larry York

O-65  To be and not to be maintained: two different developmental programs for the root apical meristem—Joseph Dubrovsky

O-66  Arginine methylation of plant proteins, its role in shaping root architecture and in negotiating the interaction with mycorrhizal fungi—Jonathan Plett

O-67  Root bark percentage in apple roots is correlated with rootstock-induced dwarfing of apple scions—Nicola Harrison

O-68  Quantifying effects of internal structures on root biomechanics using laser ablation—Kenneth Loades

12.30 pm – 1.30 pm  LUNCH  Foyer
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.30 pm – 2.50 pm</td>
<td><strong>PLENARY SESSION 6</strong>&lt;br&gt;Roots for the future&lt;br&gt;Chairs: John Kirkegaard, Hallie Thompson and Kenny Png</td>
</tr>
<tr>
<td>1.30 pm – 2.10 pm</td>
<td>Student Forum</td>
</tr>
<tr>
<td>2.10 pm – 2.50 pm</td>
<td>Keynote 19&lt;br&gt;Root science for future food security—meeting the challenge in China—Jianhua Zhang</td>
</tr>
<tr>
<td>2.50 pm – 3.10 pm</td>
<td>Symposium close</td>
</tr>
<tr>
<td>3.15 pm</td>
<td><strong>AFTERNOON DRINKS</strong></td>
</tr>
</tbody>
</table>