“Plant Production Systems - Workshop”

UWA Institute of Agriculture Plant Production Systems Program Annual meeting
**Date:** Monday 7th July 2008  
**Time:** 8.40am – 5.00pm  
**Venue:** WA Ecology Centre, Bold Park, 165 Perry Lakes Drive, Floreat

**Theme:**
“Crop improvement research and education in Western Australia”

**Aims of the Workshop:**
1. A better understanding of current crop improvement activities by various players in WA;  
2. Key challenges and opportunities in crop improvement in WA and nationally;  
3. Improved collaboration on crop improvement education and research.

**Outcome of the workshop - Talks**

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<th>Speaker</th>
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<td>Mr Robin Wilson</td>
<td>“Wheat improvement in WA – past, current and future”</td>
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<td>Dr Reg Lance</td>
<td>“Barley improvement in WA – past, current and future”</td>
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<td>A/Prof. Wallace Cowling</td>
<td>“Canola improvement in WA – past, current and future”</td>
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<td>Dr Bevan Buirchell</td>
<td>“Lupin improvement in WA – past, current and future”</td>
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<td>Prof. Willie Erskine</td>
<td>“Pulse improvement in WA – past, current and future”</td>
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<td>Dr Steve Milroy</td>
<td>“Crop improvement research at CSIRO – past, current and future”</td>
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<td>Dr Susan Barker</td>
<td>“Education of plant improvement at UWA - past, current and future”</td>
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<td>Professor Kadambot Siddique</td>
<td>“International Centre for Plant breeding Education and Research at UWA”</td>
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**Outcome of the workshop – Group discussions**

**GROUP A (Leader: Jon Clements)**

1. **What's UWA strength in different crops/traits?**  
   - Legume research – lupin, field pea, chickpea  
   - Barley – germplasm; phenology; scald resistance  
   - Pasture crops – genetic resources  
   - Horticultural crops - native plants  
   - Canola – germplam, wide hybridisation, disease screening, molecular biology and commercial breeding  
   - Salinity  
   - Waterlogging  
   - Drought
Trace element deficiencies and toxicities
Herbicide research
Chilling tolerance

2. **Which crops/traits should UWA focus on?**
   - Barley germplasm for specific traits
   - Transient waterlogging/micro-elements
   - Crop-weed competition/modelling
   - Nitrogen fixation
   - Drought screening - collaboration; automation; remote sensing.
   - Lupins for heath
   - Seed quality
   - Nitrogen use efficiency
   - Phosphorus use efficiency
   - Sub soil toxicity
   - Salinity
   - Boron
   - Frost/cold
   - GM legume
   - Wide hybrids – cyto/molecular Genetics. FISH
   - Double haploids
   - Virus resistance
   - Root research
   - Double haploid
   - Molecular markers, deep sequencing, epigenetics

3. **How can UWA do better?**
   - Focus on Wheat, barley, canola and legumes (lupin, field pea, chickpea and selected pasture legumes) pre-breeding, germplasm
   - Work closely with different breeding programs - at project level and joint 4th year and postgraduate supervisor
   - Approaches from all angles including molecular, physiological and biochemical sides to evaluate traits
   - Creation of new germplasm through wide hybridisation and mutation breeding

**Group B (Leader: Cameron Beck)**

**What should UWA do on Breeding?**
**What's the Balance of pre-breeding and breeding?**
**Should we expand or should we be more focussed?**

1. We must work to strengths – oilseeds, legumes, barley
2. Focus on practical hands-on experience eg: linkages that traditional USA universities had to public breeding programs.
3. Should not be commercial unless there is a specific case eg: CBWA, therefore pre-breeding should be the focus but pre-breeding must be linked to commercial/public programs
4. Involve studentships/internship in working plant breeding programs
5. Invest and research market failure issues in existing programs
6. Closer links with DAFWA – students, joint appointments, guest lecturers, etc.
7. Be ready to create commercial partnerships if the opportunities arise eg: CBWA
8. ICPBER – ensure that practicing plant breeders are on the technical advisory committee.

**Group C (Leader: Susan Barker)**

**Future directions for plant improvement education**
**How can we increase undergraduate and postgraduate student numbers?**
**Is Masters by course a way to go?**
**How do we balance local and international intakes?**

° Existing program links, time in breeding program, e.g student holiday work.
Future Directions for Plant Improvement Collaboration

How can we engage plant breeders in education and research at UWA more efficiently?

How can we engage funding bodies in education and research at UWA more efficiently?

• To engage Funding Bodies to invest in plant breeding research and education very accurate targeting of individual funding bodies (both national and international) is required through close analysis of their individual requirements.

• On occasions, farmer lobbies can be effectively used to promote specific research.

• Judicious use of topical issues such as Climate Change; Food Security and the Food Crisis in applications is warranted.

• Capital should be made of past successes in plant breeding to indicate a strong track record from investment in research.

• For investment in PB studentship/scholarships we need to capitalize/focus on: Why study at UWA?

• Track record of PB research at UWA - currently funded at > $ 5.00 million

• Use of applied biotechnology in breeding

• Focus on adaptation to climate change in marginal lands

• Strong links with PB Industry - both private and public

• Strong international links and possibility of doing research for PhD at International Centres

To engage plant breeders more closely with PB Education at UWA:

• Post-graduate students: There’s a need for advanced planning of research with all concerned in order to cope with the low time availability of breeders. The problem of asynchrony between the academic calendar and growing season was noted.

• We need to increase the profile of industry breeders to encourage students to want to study with them and possibly publish their seminars on the ICPBER website to do this.

• Collaboration has to be properly acknowledged.

• There may be scope for mini-sabbatical for public industry breeders to UWA to increase engagement with PB education.
The forum was chaired by Prof. Steve Powles, Leader of the PPSP, Prof. Lyn Abbot, Acting Dean of FNAS and concluding comments were made by Dr Robert Loughman, Leader of the Cereal Breeding Program, DAFWA and Dr Guijun Yan, Deputy Leader of the PPSP