

# Annual Diagnosticians' Workshop 2016

## Workshop Report

CSIRO, Canberra

16<sup>th</sup>-17<sup>th</sup> February 2016

This workshop was organised by the Subcommittee on Plant Health Diagnostics, CSIRO and Plant Health Australia. Financial assistance was provided by the Australian Government Department of Agriculture and Water Resources .



**Australian Government**  
Department of Agriculture  
and Water Resources



## Summary of the Annual Diagnosticians' Workshop 2016

The CSIRO Ecosystem Sciences, Black Mountain Laboratories hosted the fifth Annual Diagnosticians' Workshop (ADW). The theme of this year's workshop was 'Reference Collections' and the workshop, which ran on the 16<sup>th</sup> and 17<sup>th</sup> of February 2016, was complemented by two training workshops (Table 1).

Participants included diagnosticians from state, territory and Commonwealth governments, CSIRO, Plant Health Australia (PHA), Sugar Research Australia (SRA), Enza Zaden Australia, New Zealand Ministry of Primary Industries (NZ MPI), and New Zealand Plant and Food Research (NZ PFR).

**Table 1.** Overview of activities relating to the ADW2015

Date	Mon, 15 <sup>th</sup> Feb	Tue, 16 <sup>th</sup> Feb	Wed, 17 <sup>th</sup> Feb	Thu, 18 <sup>th</sup> Feb
Activity	<b>Basic and Practical Aspects of Specimen Curation</b>  <i>Preparing, storing, monitoring and transporting specimens</i>	<b>ADW2016</b>  <i>Presentations detailed in Table 3.</i>	<b>New Developments and Advanced Techniques in Collection Management</b>  <i>Digitisation of records, biological nomenclature and databases</i>	

Presentations and activities at the ADW showcased the importance of collections to delivering an effective biosecurity system, and together with the workshops, provided professional development and networking outcomes. The key ADW activities included:

- A keynote presentation on the importance of connecting with international collections and experience as an Australian Botanical Liaison Officer at Kew Gardens
- Reports from NPBDN members who has recently undertaken Laboratory Residentials
- Introduction to a new Commonwealth program to deliver improved diagnostics in Northern Australia
- Engagement on new tools to support fruit fly diagnostics and surveillance coordination
- Involvement in the ongoing programs under the Subcommittee on Plant Health Diagnostics (SPHD) and the National Plant Biosecurity Diagnostic Network (NPBDN), including professional development, Reference Collections Working Group and National Diagnostic Protocols
- Workshop sessions to record the full spectrum of reference collections active in the NPBDN

The outcomes from the ADW2016 (Table 2) continued to demonstrate its great value for the National Plant Biosecurity Diagnostic Network (NPBDN), and the strong support for it as a standing event on the NPBDN calendar.

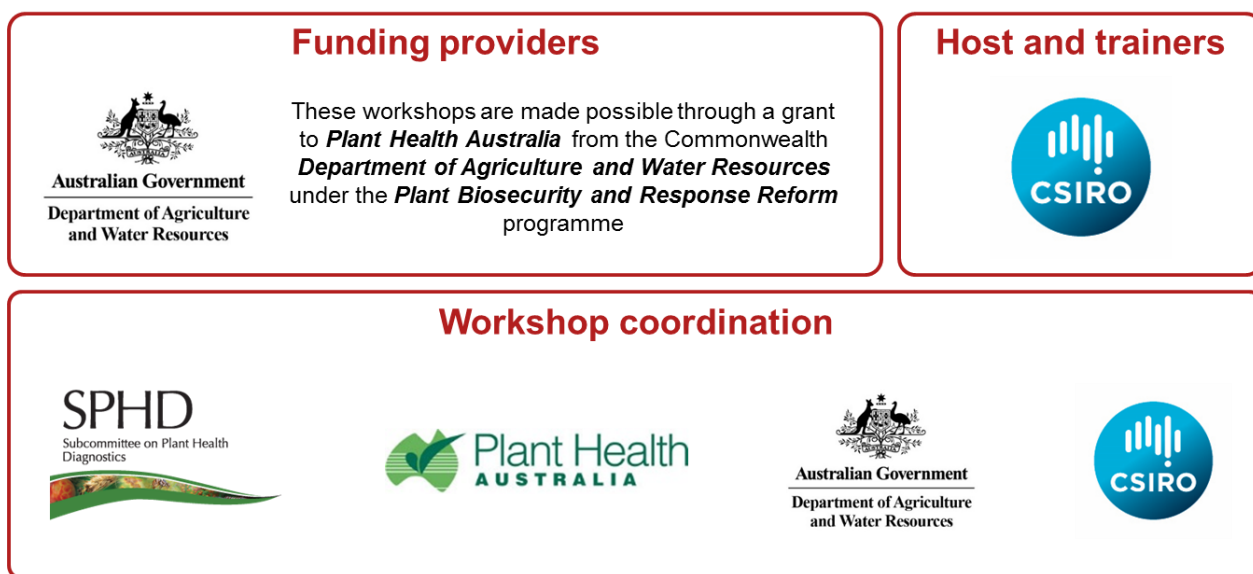
**Table 2.** Key outcomes of the ADW2016

No.	Outcome
1	Recognition of the benefits of having a well maintained collection for reference
2	Sharing of ideas and knowledge amongst NPBDN
3	Recognition of the value and support for the continuation of the Laboratory Residential program and National Diagnostic Protocols (NDPs)
4	Increased awareness in the goals and activities of the NPBDN and SPHD
5	Extension of networking opportunities with the attendance at the ADW of a number of new participants.
6	Recognition of the benefits of having a well maintained collection for reference



## Acknowledgements

The ADW2016 and associated training would not have been possible without support (Figure 1).



**Figure 1.** Individuals and organisations that supported the delivery of the ADW2016

## About the ADW and the report

ADWs are an initiative of the **Subcommittee on Plant Health Diagnostics (SPHD)** and a recommendation from the **National Plant Biosecurity Diagnostic Strategy**. These workshops improve Australia's plant pest diagnostic capability and capacity through encouraging the sharing of expertise and the delivery of targeted training.

This report provides a summary of the ADW2016 for NPBDN members. It is not a comprehensive record of activities, and anyone looking for further information should contact the Executive Officer of the NPBDN at [SPHDS@agriculture.gov.au](mailto:SPHDS@agriculture.gov.au).



**Figure 2.** Participants at the ADW2016

## ADW2016 sessions

ADW 2016 activities and presentation aligned with the collection management theme of the associated workshops. Table 3 outlines the sessions and the key points recorded from each activity. Copies of the presentations are available on the NPBDN website<sup>1</sup>.

**Table 3.** Summary of ADW2016 activities

Session	Presentation	Key points
<b>Key note presentation</b>	Working with International Collections – Kew Gardens  <b>Tony Orchard</b>	<ul style="list-style-type: none"> <li>• Fulfilled the role of the Australian Botanical Liaison Officer at Kew Gardens in 2008-09</li> <li>• Valuable position that benefited Australia, with over 180 enquiries answered during this time</li> <li>• Discovered several new species during his time as Australian botanical liaison officer and published two books on Alan Cummings</li> <li>• International collections are a valuable resource, holding much larger numbers of specimens than those in Australia, including many originating from Australia</li> </ul>
<b>Laboratory Residential Program reports</b>	Termite Diagnostics  <b>Brian Thistleton</b>	<ul style="list-style-type: none"> <li>• Hosted by NSW DPI at Orange, taking advantage of the significant termite collection</li> <li>• Continuing the work initiated at a termite diagnostic workshop in Darwin in 2011</li> <li>• Dual residential, with Mary Finlay-Doney also participating</li> <li>• Outcomes included improved skills in termite identification and the up-skilling of a new NT DPIF entomologist in termite diagnostics</li> <li>• Assisted in the development of a Lucid key and reorganisation of the NSW collection into taxonomic order</li> <li>• Assisted with reordering the termite collection at Orange into taxonomic order</li> <li>• Participated in a training workshop for NSW DPI staff</li> <li>• Next steps include producing an NDP for <i>Coptotermes</i></li> </ul>
	Lentil anthracnose  <b>Yu-Pei Tan</b>	<ul style="list-style-type: none"> <li>• Hosted by the Crop Development Centre, University of Saskatchewan, Canada</li> <li>• Provided with firsthand experience of the pathogen, allowing for verification of molecular tests, taking into consideration the updated taxonomy</li> <li>• Updated molecular protocol, leading to the submission of a new version of the National Diagnostic Protocol (NDP) with new primer design and updated diagnostic flow chart</li> </ul>
	Palynology techniques  <b>Mary Finlay-Doney</b>	<ul style="list-style-type: none"> <li>• Hosted by Palaeoworks, Department of Archaeology and Natural History, Australian National University (ANU), which holds a large pollen collection</li> <li>• Investigating pollen from known host plant species of Cucumber Green Mottle Mosaic Virus to aid in understanding the spread of the virus</li> <li>• Developed skills in pollen sample preparation and their subsequent identification</li> <li>• Pollen from the target species proved very difficult to prepare</li> <li>• Pollen processing capacity will now be setup in Darwin laboratory</li> </ul>

<sup>1</sup> Available to NPBDN members at <http://plantbiosecuritydiagnostics.net.au/annual-diagnostics-workshop-2016>



Session	Presentation	Key points
	Barrow Island <b>Peter Langlands</b>	<ul style="list-style-type: none"> <li>Hosted by the Australian National Insect Collections (ANIC), CSIRO</li> <li>Focussed on building improved skills in mite diagnostics</li> <li>Rehabilitated a number of dried reference slides of mites collected from Barrow Island</li> <li>Identified five new families and approximately 13 new species for Barrow Island</li> <li>Added 11 families, 14 generic and two species names to the ANIC collection</li> </ul>
<b>Professional development</b>	Past and future professional development opportunities <b>Luke Watson</b>	<ul style="list-style-type: none"> <li>SPHD has facilitated a range of professional development activities in the past 12 months, including: <ul style="list-style-type: none"> <li>Heteroptera workshop in Melbourne</li> <li>Colletotrichum workshops in Brisbane and Perth</li> <li>Bacteriology mentoring through NSW DPI</li> <li>Laboratory Residentials</li> </ul> </li> <li>The planned activities to be delivered in the coming months include: <ul style="list-style-type: none"> <li>Bee mite molecular diagnostics workshop (see below)</li> <li>Diaporthe diagnostic workshop</li> <li>Specialist longicorn diagnostics workshop</li> <li>A further round of Laboratory Residentials</li> </ul> </li> </ul>
	Bee Mite Diagnostics <b>John Roberts</b>	<ul style="list-style-type: none"> <li>A Laboratory Residential will be completed in New Zealand to complete the molecular diagnostics for the suite of target mite pests of bees</li> <li>The new learnings, together with the current expertise, will be leveraged to deliver a bee mite molecular diagnostics workshop in late 2016</li> </ul>
<b>Projects supporting diagnostics</b>	Tropical Biosecurity Diagnostics Network <b>James Walker</b>	<ul style="list-style-type: none"> <li>Two white paper initiatives from the Commonwealth Government have seen \$200 million dollars invested into Northern Australia to improve biosecurity</li> <li>A Tropical Biosecurity Diagnostics Network, as a component of the wider NPBDN, is proposed with a focus on improving diagnostic training and tools for diagnosticians delivering services to the tropics</li> <li>The initiative hopes to leave a substantial legacy following the completion of the three-year funding cycle</li> <li>A framework for the initiative is due to be in place around June</li> </ul>
	Fruit Fly Diagnostic Handbook <b>Nicholas Woods</b>	<ul style="list-style-type: none"> <li>The second version of the Australian Handbook for the Identification of Fruit Flies is now completed and due for release</li> <li>The handbook is written for diagnosticians as a comprehensive identification guide to 60 exotic and endemic economically important species of fruit fly</li> <li>A significant project is already underway to develop a third version of the handbook, extending the strength of the molecular techniques and investigating new technologies</li> </ul>
	<i>AUSPestCheck</i> <b>Nicholas Woods</b>	<ul style="list-style-type: none"> <li><i>AUSPestCheck</i> is an innovation project to demonstrate a functioning virtual surveillance coordination centre</li> <li>Provides real-time surveillance data captured by jurisdictions, presenting an accurate national picture</li> </ul>



Session	Presentation	Key points
<b>Collections in the NPBDN</b>	Reference Collections Working Group <b>Mike Hodda</b>	<ul style="list-style-type: none"> <li>The Reference Collections Working Group (RCWG) was formed under SPHD in 2015, tasked with developing a strategy for the long-term maintenance of reference collections supporting biosecurity</li> <li>RCWG have identified and documented the key policy and operational elements to ensure reference collection viability</li> <li>To better inform further work, RCWG will be undertaking a stocktake of current reference collections, which will feed into the strategy and implementation plan</li> </ul>
	Interactive session – Stocktake of collections <b>Mike Hodda</b>	<ul style="list-style-type: none"> <li>Participants split into small groups and listed collections around Australia, New Zealand and the Pacific</li> <li>Summary of the output of this activity are shown in Table 4</li> </ul>
<b>SPHD report</b>	SPHD update <b>Barbara Hall</b>	<ul style="list-style-type: none"> <li>There are currently five active working groups under SPHD, including two new groups covering surveillance diagnostics and surge capacity</li> <li>Surveillance diagnostics is a new area for SPHD, broadening from definitive taxonomic identification of pests</li> <li>The policy and operational elements required to utilise diagnostic capability and capacity across jurisdictions during emergency responses will be the deliverable of the Surge Capacity Working Group</li> <li>NDPs continue to be a focus of SPHD, with 34 currently endorsed, and they are now citable publications</li> </ul>
<b>Facility tours</b>	Facility tours	<ul style="list-style-type: none"> <li>Australian National Insect Collection – iconic and charismatic</li> <li>Australian National Insect Collection – biosecurity insects and nematodes</li> <li>Australian National Herbarium</li> <li>Australian National Botanic Gardens Fungal Collection</li> </ul>

## Reference collection stocktake session – outputs

During the ADW, participants identified known reference collections across Australia through an interactive workshopping session. The session identified a range of working, formal, research, teaching and historical collections (summary provided in Table 4) that will inform future structured audits.

**Table 4.** Summary of reference collections identified during the interactive session

Name	Coverage <sup>2</sup>	Type
<b>National</b>		
Australian National Herbarium	Flowering plants and ferns, Cryptogams, plant specimens	Historical
Australian Museum Arachnology Collection	Arachnids, Myriapods, Onychophorans, Tardigrades	Historical
Australian Museum Entomology Collection	Acalyptrate, Diptera, Psocoptera, Chrysomelidae, Neuroptera, Megaloptera, Lepidoptera, Coleoptera	Historical
Australian Museum Malacology Collection	Molluscs	Historical

<sup>2</sup> Description as provided



Name	Coverage <sup>2</sup>	Type
Department of Agriculture and Water Resources - Seed collection	Seed collection	Working
NAQS Plant Pathology Collections	Herbaria, fungi, bacteria, DNA, slides, images	Working, Reference
Australian National Algae Culture Collection	Microalgae species	Reference
Australian National Botanic Gardens Seed Collection	Australian native seeds	
Gauba Herbarium	Fungi and Plantae	Reference, Research, Teaching
<b>New South Wales</b>		
Animal bacterial collections	Animal bacteria	Working
Aphid Collection	Aphids	Working
Bacterial and DNA Collection	Bacteria	Working
Cotton Pathology Isolate Collection		Working
Dorsalis DNA	Fruit fly	Working
Fruit fly DNA	Fruit fly	Working
General insect pest collection	General insect pest	Working
Living citrus virus and viroids collection	Living citrus virus and viroids	Working
Macleay Museum collection	Anthropology and natural history	Historical
Royal Botanic Garden Herbarium	Fusarium, Phytophthora	Reference
<i>Verticillium dahliae</i>	<i>Verticillium dahliae</i>	Working
<b>Northern Territory</b>		
DNA, RNA collection	Fungi, Bacteria, Viruses, Phytoplasma	Working
Weeds	Plants	Working
CSIRO Tropical Ecosystems Resource Centre	Entomology, particularly ants	Working, Reference, Taxonomic
NAQS Working Collection	Entomology	Working
Northern Territory Museum Collection	Entomology, snails, fish, animals	Reference
Northern Territory Herbarium		Working, Reference
Medical Entomology Collection	Invertebrates of medical importance, mainly mosquitoes	Working
DNAP	Bacteria, Fungi, Rust	Working
Northern Territory Entomology	Insects, Mites, Spiders, Snails	Working, Reference, Taxonomic
<b>Queensland</b>		
Phytophthora DNA and living collection		
AIMS	Marine specimens, corals, algae	Working
Queensland Herbarium (BRI)	Fungi, Plantae	
CSIRO Biological control collection		
Entomology collection	Entomology	



Name	Coverage <sup>2</sup>	Type
Biosecurity Queensland Cairns Collection	Focus on tropical insects, pest	
Queensland Plant Pathology Herbarium	Queensland plant-parasitic & plant-associated microfungi	
Griffith University Collection	Fruit fly	Working
Queensland Primary Industries Insect Collection	Biocontrol agents, weed-associated insects	
Queensland Museum	Entomology, molluscs, arachnids	Reference, Historical
NER (DAWR) Quarantine	Entomology, mites, seeds	Working
Cairns (DAWR) Quarantine	Entomology, lulicids, mealybug	Working
James Cook University Herbarium	All taxonomic herbarium including algae	
Freeze dried virus	Virology	Working
Viral antisera	Virology	Working
Sugar Research Australia	Entomology, pathology	
University of Queensland	Bacteria	
NAQS	Entomology	Working, Reference
Biological Crop Protection	Nematodes	
<b>South Australia</b>		
Private Collection	Entomology	Formal, Private
SARDI	Cereal pathology isolates	Working
SARDI	Virus, Frozen controls, freeze-dried tissue	Working
University of Adelaide	Plant pathogens, fungal isolates, insects	Working
University of Adelaide	Virology	Working
SARDI	Nematology	Working
SARDI	Grapevine pathogens	Working
South Australia Museum	Entomology	Formal & display
South Australian Herbarium	Plants, fungi	
SARDI	Water collection, fungi, other	Working
SARDI	Diagnostic data, crop disease data	Working
Flinders University	Bio control section	
South Australia Matriculation	Tissue/DNA, Entomology	Formal
Wine Microorganism Culture Collection	Wine-relevant strains	Working
<b>Tasmania</b>		
Tasmanian Plant Pest Database	Agricultural Tasmanian focus plus forestry, wildlife and cave surveys	
Tasmanian Forest Insect Collection	Entomology	Working
Queen Victoria Museum Collections	Invertebrate specimens	
Tasmanian Museum & Art Gallery		
Tasmanian Herbarium	Vascular plants, bryophytes, lichens, algae and fungi	Reference
Tasmanian Institute of Agriculture		





Name	Coverage <sup>2</sup>	Type
Royal Tasmanian Botanical Gardens	Plantae	
Tasmanian Seed Conservation Centre	Seeds of native flora, weeds and garden exotics	
University of Tasmania	Entomology	Working
<b>Victoria</b>		
Cesar Australia	Entomology	Working
University of Melbourne	All pathogens	Working
La Trobe University	All pathogens	Working
VICSPA	Seed potatoes	Working
Victorian Strawberries Industry Certification Authority		
Deakin University	All pathogens	
Deakin University	All pathogens	
Museum of Victoria	Entomology	
DEDJTR	DNA/Tissue, invertebrates	Formal
Victorian National Herbarium	Plants, lichens	Formal
DAWR	Insects, plant pathogens	Formal
<b>Western Australia</b>		
Bennelongia Environmental Consultants	Subterranean, Entomology, Spiders	Working
Murdoch University	Phytophthora, Pythium living collection	
Private Collection	Slaters	Working
Broome Regional Herbarium	Kimberly & North West WA plants and weeds	Working
Western Australian Herbarium	Plant pathogens	Formal
Department of Parks and Wildlife	Entomology	Formal
Western Australian Museum	Entomology, arachnid, molluscs, nematodes	Formal
Murdoch University Vet School	Vet, medical, ticks	Working
Phoenix Environmental Consultants	Arachnids	Working
DAFWA	Entomology	Formal
DAFWA	Pathology	Formal
Kings Park and Botanic Garden Herbarium	Western Australian plant specimens	Working
Edith Cowan University Robert Brown Herbarium	All major plant groups	Research, Teaching
Western Australia Culture Collection	Bacteria, fungi, yeast	Working
University of Western Australia Microbial Culture Collection	Bacteria, fungi, yeast	Reference, Research
Western Australia Department of Parks and Wildlife, Threatened Flora Seed Collection	State's conservation listed seeds	Working



## Appendix 1 – ADW2016 attendees

Table 5. NPBDN members who attended the ADW2016

Name	Organisation	Name	Organisation
Adrian Nicholas	NSW DPI	Karen Kirkby	NSW DPI
Ainsley Seago	NSW DPI	Karren Cowan	NSW DPI
Alison Dann	TAS DPIPWE	Kathryn Braithwait	SRA
Andrew Daly	NSW DPI	Laura Marsh	DAWR
Barbara Hall	SARDI	Leigh Pilkington	NSW DPI
Ben Boyd	DAWR	Linda Semeraro	VIC DEDJTR
Brian Thistleton	NT DPIF	Lucas Shuttleworth	NSW DPI
Cameron Brumley	DAFWA	Lucy Tran-Nguyen	NT DPIF
Carol Muir	NZ MPI	Luke Watson	DAWR
Catherine Harvey	DAWR	Mallik Malipatil	VIC DEDJTR
Chris Anderson	NSW DPI	Mark Blacket	VIC DEDJTR
Craig Marston	DAWR	Mary Ann Terras	NSW DPI
Crispus Fanai	Biosecurity Solomon Islands	Mary Finlay-Doney	NT DPIF
Danuta Knihinicki	NSW DPI	Marzena Krysinska-Kaczmarek	SARDI
David Britton	DAWR	Merje Toome	NZ MPI
David Yates	CSIRO	Mike Hodda	CSIRO
Dean Beasley	QLD DAF	Nicholas Woods	PHA
Deb Hailstones	NSW DPI	Nitesh Datt	Biosecurity Authority of Fiji
Douglas Kerruish	DAWR	Peter Gillespie	NSW DPI
Elaine Tou	DAWR	Peter Langlands	DAFWA
Eliza Finlay	DAWR	Rebecca James	DAWR
Elizabeth Wilson	SRA	Robyn Brett	VIC DEDJTR
Grace Sun	Enza Zaden	Roger Shivas	QLD DAF
Grant Smith	PBCRC/ NZ PFR	Sally Cowan	DAWR
Haidee Brown	NT DPIF	Sophie Peterson	DAWR
Helen Degraaf	SARDI	Stephen Dibley	PHA
Jacky Edwards	VIC DEDJTR	Subuhi Khan	NZ MPI
James Walker	DAWR	Sue Pederick	SARDI
Jane Royer	QLD DAF	Toni Chapman	NSW DPI
Jodie Cheesman	QLD DAF	Tony Orchard	ABRS
John Nielsen	DAWR	Visnja Steele	QLD DAF
John Roberts	CSIRO	Yu Pei Tan	QLD DAF

## Appendix 2 – Participant feedback summary

ADW 2016 participants provided feedback to organisers on the day of the workshop. A summary of this feedback is presented in Figure 3 (1 = unsatisfactory; 3 = neutral; 5 = exceeds expectations).

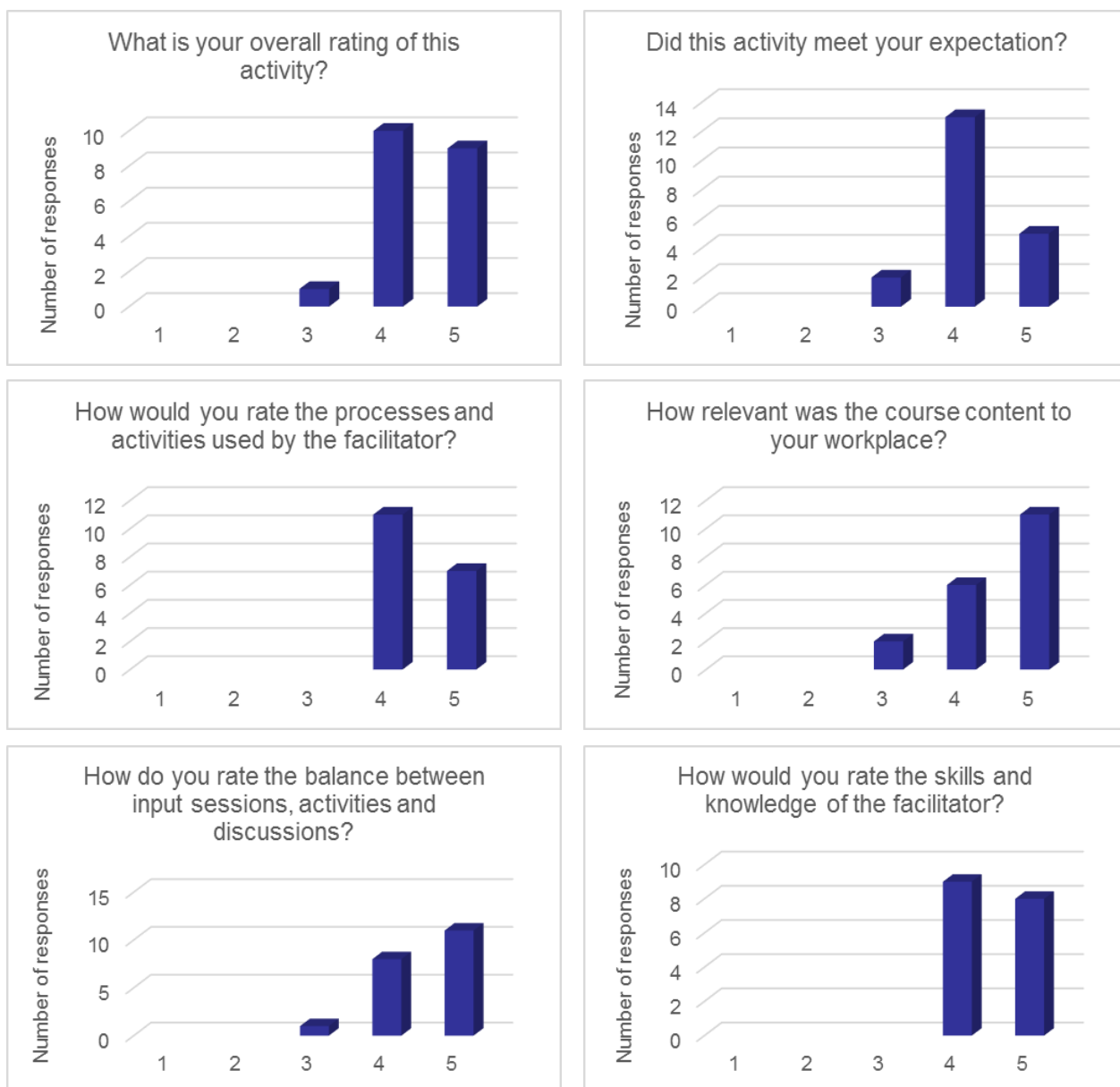


Figure 3. Responses collected on participant experiences and expectations from ADW 2016



**NPBDN**   
National Plant Biosecurity  
Diagnostic Network

**Contact us**

Email: [sphds@agriculture.gov.au](mailto:sphds@agriculture.gov.au)

[www.plantbiosecuritydiagnostics.net.au](http://www.plantbiosecuritydiagnostics.net.au)