



Guidelines for Diagnostic Residentials under the NPBDN

The Diagnostic Residential Program forms an integral component of the professional development framework of the National Plant Biosecurity Diagnostic Network (NPBDN). Residentials provide excellent opportunities for plant biosecurity diagnosticians to share ideas and practices, together with gaining essential skills and knowledge relevant to their role. The underpinning purpose of the Diagnostic Residentials is to improve the national plant biosecurity diagnostic capability and capacity through improving the capability of individuals.

A Diagnostic Residential involves a plant biosecurity diagnostician, or diagnosticians, spending time in another laboratory, workplace, or participating in relevant activities for a defined purpose or outcome. This may include, but is not limited to:

- Improving diagnostic skills by working with a pest expert in another Australian diagnostic laboratory
- Visiting a laboratory overseas to get direct experience with significant plant pests
- Participating in surveillance programs
- Drafting a National Diagnostic Protocol while visiting a laboratory with expertise in the target pest
- Learning new techniques or gaining exposure to laboratory accreditation through visiting laboratories where they are currently implemented

The length of each Diagnostic Residential will vary depending on the activities and the specified outcomes, although typically these have been between 5 and 14 days. Diagnostic Residentials funded under the current round of funding can be undertaken at any time between October 2018 and June 2019.

This is an **open round of Diagnostic Residential applications**, with all applications that show benefit to NPBDN considered for funding. If appropriate, there is an option to specify that the Diagnostic Residential will address:

- A known diagnostic gap for National Priority Plant Pests¹ (NPPPs) – see Appendix 1 of this document for a listing
- A known diagnostic gap for tropical diagnostics – see NPBDN website² for gap analysis

The Diagnostic Residential Program is funded through a grant to Plant Health Australia from the Australian Government Department of Agriculture and Water Resources under the Plant Biosecurity and Response Reform programme and White Paper funds.

Eligibility

To be eligible for a Diagnostic Residential you must be employed in a plant health laboratory or organisation in Australia or New Zealand and be a member of the NPBDN³.

Application process

To apply for a Diagnostic Residential, download the application form from the NPBDN website (plantbiosecuritydiagnostics.net.au/news-events/professional-development/current-activities/), complete the required fields, including support from the applicant's line manager and the manager of the host laboratory/organisation. The form can then be submitted to the NPBDN Executive Officer at sphd@agriculture.gov.au.

¹ Information about the NPPPs can be found at www.agriculture.gov.au/pests-diseases-weeds/plant/national-priority-plant-pests-2016

² Tropical diagnostic gap analysis are available for download from plantbiosecuritydiagnostics.net.au/about-npbdn/tropical-diagnostics/

³ To join the NPBDN visit plantbiosecuritydiagnostics.net.au/about-npbdn/membership/



Assessment of applications

All applications will be assessed by the Network Implementation Working Group, under the Subcommittee on Plant Health Diagnostics (SPHD), based on the following criteria:

1. Activities demonstrated to provide benefit and/or professional development directly related to plant biosecurity diagnostics and the NPBDN
2. Demonstrated benefit to the applicant's and host's laboratories/organisations
3. Clear and beneficial outcomes and outputs articulated
4. Demonstrated means to disseminate outcomes and outputs to the applicant's organisation and the wider NPBDN

Plant Health Australia will use the outcome of the assessment by the Network Implementation Working Group to determine the Diagnostic Residentials to be funded. Successful applicants will then be contacted by the NPBDN Executive Officer and provided instructions on how to progress.

Guide to budgets

Diagnostic Residentials are commonly in the range of \$3,000 to \$12,000, however applicants may propose budgets outside this range.

The program encourages a collaborative approach between participating agencies. Diagnostic Residentials can cover the costs of travel, accommodation, bench fees (if applicable) and some consumables. In kind support from participating organisations is expected, and can include wages, registration fees (for associated conferences and workshops) and some consumables.

Timelines

Applications open on the 29th August 2018 and close at 5 pm AEST on the 21st September 2018. Successful applicants will be informed by the 26th October 2018.

It is preferred that the Diagnostic Residentials are undertaken prior to the end of June 2019, but extensions to this timeframe can be negotiated.

Key contact and further information

If you would like further information, support with identifying host laboratories or workplaces, or support with the application process, please contact the NPBDN Executive Officer through sphd@agriculture.gov.au or (02) 6272 3209.

You may also wish to talk with your local SPHD member, whose contact details can be found at plantbiosecuritydiagnostics.net.au/sphd/sphd-members/.

Appendix 1: National Priority Plant Pest Diagnostic Capability/Capacity Gaps

The diagnostic capability and capacity across all diagnostic resources for every National Priority Plant Pest (NPPP) were assessed in late 2017, using the knowledge of the National Plant Biosecurity Diagnostic Network (NPBDN) members. Diagnostic resources were divided into five key areas:

1. **Specimens** – specimens of the target pest and relevant closely-related species held in reference collections appropriate to confidently identify the pest
2. **Molecular resources** – information and techniques for identifying the target pest and separating it from closely-related species using gene sequences (including the number, sources, veracity and distinctiveness of the sequences available)
3. **Diagnostic protocols** – peer-reviewed or nationally/internationally endorsed protocols for definitive taxonomic identification of the target pest
4. **Diagnostic images** – high quality images of enough veracity to identify the target pest from closely related species (a partial alternative to specimens and diagnostic protocols)
5. **Human resources** – expertise with informal skills and knowledge sufficient to diagnose and verify the target pest that will be available for some time into the future

Gaps in these resources which affect ability to diagnose each NPPP are presented in Table 1. Gaps in every resource for a pest indicate a very great need for resources for that pest, although gaps in a specific resource for a species can also be potentially significant. Also note that a significant resource for diagnosis of fruit flies has become available since the list was compiled⁴, so diagnostic resources are now available for most fruit flies.

Table 1. Diagnostic gaps identified for NPPPs⁵, identified by the presence of an ✕

National Priority Plant Pests	Specimens	Molecular resources	Diagnostic protocols	Diagnostic images	Human resources
<i>Acarapis woodi</i>	✕				
<i>Achatina fulica</i>	✕	✕	✕		
<i>Anastrepha fraterculus</i>	✕				
<i>Anastrepha ludens</i>	✕				
<i>Anastrepha suspensa</i>	✕				
<i>Anoplolepis gracilipes</i>			✕		
<i>Anoplophora chinensis</i>	✕	✕			
<i>Anoplophora glabripennis</i>	✕				
<i>Apis cerana</i>			✕		
<i>Apis dorsata</i>			✕		
<i>Apis florea</i>			✕		
<i>Apis mellifera capensis</i>	✕	✕	✕	✕	✕
<i>Apis mellifera scutellata</i>	✕	✕	✕	✕	✕
<i>Apis mellifera scutellata</i> (hybrid)	✕	✕	✕	✕	✕
<i>Bactericera cockerelli</i>	✕				
<i>Bactrocera albistrigata</i>	✕	✕			

⁴ The Australian Handbook for the Identification of Fruit Flies (planthealthaustralia.com.au/national-programs/fruit-fly/handbook-for-the-identification-of-fruit-fly/)

⁵ Information extracted from Hodda M & Routley S (2018) *Biological reference collections of Australia: plant health diagnostics, biosecurity and trade*. CSIRO, Australia.

National Priority Plant Pests	Specimens	Molecular resources	Diagnostic protocols	Diagnostic images	Human resources
<i>Bactrocera carambolae</i>	x				
<i>Bactrocera caryeae</i>	x	x			
<i>Bactrocera correcta</i>	x				
<i>Bactrocera curvipennis</i>	x	x			
<i>Bactrocera dorsalis</i>	x	x			
<i>Bactrocera facialis</i>	x	x			
<i>Bactrocera kandiensis</i>		x			
<i>Bactrocera kirki</i>	x				
<i>Bactrocera latifrons</i>					
<i>Bactrocera melanotus</i>		x			
<i>Bactrocera minax</i>				x	
<i>Bactrocera occipitalis</i>	x	x			
<i>Bactrocera oleae</i>	x			x	
<i>Bactrocera passiflorae</i>	x	x		x	
<i>Bactrocera psidii</i>				x	
<i>Bactrocera trilineola</i>	x	x			
<i>Bactrocera trivialis</i>	x	x			
<i>Bactrocera tsuneonis</i>		x			
<i>Bactrocera umbrosa</i>	x				
<i>Bactrocera xanthodes</i>	x	x			
<i>Bactrocera zonata</i>	x				
<i>Bursaphelenchus cocophilus</i>	x				x
<i>Bursaphelenchus xylophilus</i>					x
<i>Candidatus Liberibacter africanus</i>	x		x	x	
<i>Candidatus Liberibacter americanus</i>	x				
<i>Candidatus Liberibacter asiaticus</i>	x				
<i>Candidatus Liberibacter solanacearum/psyllauros</i>	x			x	
<i>Cephus cinctus</i>	x	x	x	x	x
<i>Cephus pygmaeus</i>	x		x	x	x
<i>Ceratitis capitata</i>					
<i>Ceratitis rosa</i>			x		
<i>Chilo auricilius</i>	x	x		x	x
<i>Chilo infuscatellus</i>	x	x		x	x
<i>Chilo orichalcociliellus</i>	x	x	x	x	x
<i>Chilo partellus</i>	x			x	x

National Priority Plant Pests	Specimens	Molecular resources	Diagnostic protocols	Diagnostic images	Human resources
<i>Chilo polychrysus</i>	x	x		x	x
<i>Chilo sacchariphagus</i>	x	x		x	x
<i>Chilo terrenellus</i>	x	x		x	x
<i>Coptotermes formosanus</i>			x		
<i>Coptotermes gestroi</i>		x	x		
<i>Cryptotermes brevis</i>		x	x		
<i>Cryptotermes domesticus</i>		x	x		
<i>Diaphorina citri</i>	x				
<i>Diuraphis noxia</i>					
<i>Drosophila suzukii</i>	x		x		
<i>Erwinia amylovora</i>	x				
<i>Eurygaster integriceps</i>	x	x	x	x	
<i>Fusarium oxysporum</i> f. sp. <i>cubense</i> Tropical race 4		x			
<i>Fusarium oxysporum</i> f. sp. <i>vasinfectum</i>		x	x	x	
<i>Globodera pallida</i>					
<i>Globodera rostochiensis</i>	x				
<i>Halyomorpha halys</i>			x		
<i>Heterodera avenae</i>	x	x	x		x
<i>Heterodera carotae</i>	x	x	x		x
<i>Heterodera ciceri</i>	x	x	x	x	x
<i>Heterodera filipjevi</i>	x		x		x
<i>Heterodera glycines</i>	x	x			x
<i>Heterodera latipons</i>	x		x		x
<i>Heterodera zaeae</i>	x	x	x	x	x
<i>Homalodisca vitripennis</i>	x				
<i>Hylesia nigricans</i>		x	x		
<i>Incisitermes minor</i>		x	x		
<i>Lepisiota frauenfeldi</i>		x	x		
<i>Liriomyza bryoniae</i>					x
<i>Liriomyza cicerina</i>	x	x	x		x
<i>Liriomyza huidobrensis</i>	x				x
<i>Liriomyza sativae</i>	x				x
<i>Liriomyza trifolii</i>	x				x
<i>Lygus hesperus</i>	x	x	x		
<i>Lygus lineolaris</i>	x	x	x	x	
<i>Lymantria albescens</i>	x		x	x	x

National Priority Plant Pests	Specimens	Molecular resources	Diagnostic protocols	Diagnostic images	Human resources
<i>Lymantria atameles</i>	x	x	x	x	x
<i>Lymantria concolor</i>	x	x	x	x	x
<i>Lymantria dispar asiatica</i>	x	x	x		x
<i>Lymantria dispar dispar</i>	x	x	x		x
<i>Lymantria dispar japonica</i>	x		x		x
<i>Lymantria dissoluta</i>	x		x	x	x
<i>Lymantria fumida</i>	x		x	x	x
<i>Lymantria marginata</i>	x	x	x	x	x
<i>Lymantria mathura</i>	x				x
<i>Lymantria minomonis</i>	x	x	x	x	x
<i>Lymantria monacha</i>	x		x		x
<i>Lymantria postalba</i>	x		x	x	x
<i>Lymantria pulvereae</i>	x	x	x	x	x
<i>Lymantria sinica</i>	x	x	x	x	x
<i>Lymantria umbrosa</i>	x	x	x	x	x
<i>Lymantria xylina</i>	x		x	x	x
<i>Mayetiola destructor</i>	x				x
<i>Mayetiola hordei</i>	x	x	x	x	x
<i>Monochamus alternatus</i>	x		x		
<i>Monochamus galloprovincialis</i>	x	x	x		
<i>Monochamus obtusus</i>	x	x	x	x	
<i>Monochamus scutellatus</i>	x	x	x	x	
<i>Monochamus titillator</i>	x	x	x	x	
<i>Mycosphaerella fijiensis</i>	x				
<i>Ophiostoma novo-ulmi</i>	x				
<i>Phymatotrichum omnivorum</i>	x		x	x	
<i>Phytophthora infestans</i> (A2 mating type)	x	x		x	
<i>Phytophthora kernoviae</i>	x			x	
<i>Phytophthora ramorum</i>	x				
<i>Plum pox virus</i>	x	x			
<i>Pomacea canaliculata</i>	x				x
<i>Puccinia graminis</i> f. sp. <i>tritici</i>	x	x	x	x	
<i>Puccinia psidii</i> sensu lato	x			x	
<i>Puccinia striiformis</i> f. sp. <i>hordei</i>	x	x			
<i>Rhagoletis completa</i>				x	
<i>Rhagoletis fausta</i>				x	

National Priority Plant Pests	Specimens	Molecular resources	Diagnostic protocols	Diagnostic images	Human resources
<i>Rhagoletis indifferens</i>		x	x	x	
<i>Solenopsis geminata</i>		x	x		
<i>Solenopsis invicta</i>		x	x		
<i>Tilletia indica</i>	x				
<i>Toxotrypana curvicauda</i>			x	x	
<i>Trioza erytrae</i>		x			
<i>Trogoderma granarium</i>	x				
<i>Tropilaelaps clareae</i>	x	x	x		
<i>Tropilaelaps mercedesae</i>	x	x	x		
<i>Varroa destructor</i>	x		x		
<i>Varroa jacobsoni</i>	x		x		
<i>Wasmannia auropunctata</i>			x		
<i>Xanthomonas citri</i> pv. <i>citri</i>	x				
<i>Xylella fastidiosa</i>	x				
<i>Zeugodacus atrisetosa</i> (prev. <i>Bactrocera</i>)	x	x			
<i>Zeugodacus cucurbitae</i> / <i>Bactrocera cucurbitae</i>					
<i>Zeugodacus decipiens</i> (prev. <i>Bactrocera</i>)	x	x			
<i>Zeugodacus tau</i> (prev. <i>Bactrocera</i>)	x				