Ngā Rākau Taketake (Saving Our Iconic Trees) SSIF Platform

High level summary of the of the research landscape: Kauri Dieback and Myrtle Rust

Various agencies have contributed information to these high-level summaries, and we acknowledge that there is a large amount of complex data behind these simple graphs. The Challenge would like to acknowledge the willingness agencies have shown to engage in *Ngā Rākau Taketake* by sharing their investment data to help us better understand the research landscape.

Accessing and pulling data such as this together is a complex task and exposes some uncomfortable truths about what has and hasn't been prioritised. Please note that this is an initial cut of the data. We are fully aware that it is still incomplete. **We need your help** to find those any research projects or programmes that we may not be aware of. If you have information on Kauri Dieback or Myrtle Rust research that has been undertaken within the New Zealand science system, Masters, PhD's, internally funded projects, larger MBIE programmes etc., we would appreciate you letting us know via support@biologicalheritage.nz

Kauri Dieback

Themes are from the kauri dieback science plan prepared by the Kauri Dieback Strategic Science Advisory Group.

An overview of Kauri Dieback research grouped by themes over the last 10 years.

	Number of projects since 2009	$ Investment since 2009
Theme 1: Surveillance, detection, diagnostics, and pathways	22	$1,470,283
Theme 2: Biology of host(s) and pathogen(s)	9	$2,792,264
Theme 3: Ecosystem impacts and interactions	3	$694,000
Theme 4: Te Ao Māori	12	$1,962,672
Theme 5: Building public/community engagement and social licence	4	$189,838
Theme 6: Control and management	27	$3,220,258
Theme: Other	2	$3,982,000
MBIE PROGRAMME: Healthy Trees (cross theme)	1	$10,416,000
. **Total**	**80**	$24,719,557

Myrtle Rust

Themes are from the Myrtle Rust Science Plan prepared by the Myrtle Rust Strategic Science Advisory Group – (June 2019 draft)

Overview of Myrtle Rust Research group by themes since 2016		
	Number of Project since 2016	**$ Investment since 2016**
Theme A: Surveillance, monitoring and impact of disease	11	$2,882,500
Theme B: Epidemiology, ecosystems and resilience	17	$4,053,827
Theme C: Te Ao Māori and Mātauranga Māori	4	$496,871
Theme D: Socioecological complexity and socioeconomic consequences	6	$1,292,950
Theme E: Species conservation, disease control and management	11	$1,235,962
Theme: Other	2	$104,000
MBIE PROGRAMME: Beyond Myrtle Rust (Cross theme)	1	$13,000,000
. **Total**	52	$23,066,110

See over for detail on Themes from the KDB and MR science plans

More detail on themes from Kauri Dieback Science Plan:

Theme 1: Surveillance, detection, diagnostics, and pathways

1.1 Can we make disease and pathogen testing cheaper, faster and better?
1.2 Using surveillance to inform science and management 1.3 Pathways and vectors

Theme 2: Biology of host(s) and pathogen(s)

2.1. Biology, ecology, genetics, and pathology of *Phytophthora* species associated with declining kauri trees
2.2. Kauri responses to *Phytophthora*
2.3 Role of biotic and abiotic environment on predisposing kauri to decline

Theme 3: Ecosystem impacts and interactions

3.1 Assessing forest health and understanding the kauri ecosystem
3.2 Ecological impacts of kauri dieback
3.3 Kauri ecosystem health and resilience

Theme 4: Te Ao Māori

4.1 Māori leadership and participation
4.2 Trust and confidence (cultural licence)
4.3 Awareness and engagement
4.4 Mātauranga Māori solutions for kauri dieback
4.5 Control and management

Theme 5: Building public/community engagement and social licence

5.1 Facilitating community engagement and social licence
5.2 Working in a transdisciplinary environment
5.3 Understanding audiences
5.4 Developing a knowledge base
5.5 Developing, monitoring and evaluating management tools and social licence

Theme 6: Control and management

6.1 Developing control tools to stop the impact and spread of kauri dieback
6.2 Developing management tools to stop the impact and spread of kauri dieback

More detail on themes from Myrtle Rust Science Plan:

Theme A: Surveillance, monitoring and impact of disease

Develop and implement standardised and informative myrtle rust surveillance, monitoring and impact assessment programmes for New Zealand myrtle plants and associated ecosystems.

A.1 Diagnostics, surveillance and monitoring tools

A.2 Monitor the emerging impacts of myrtle rust

Theme B: Epidemiology, ecosystems and resilience

To improve understanding of disease epidemiology and factors influencing disease impact, host susceptibility and ecosystem resilience.

B.1 Understanding pathogen and environmental influences

B.2 Understanding Myrtaceae as hosts

B.3 Ecosystem interactions and cumulative effects

Theme C: Te Ao Māori and Mātauranga Māori

To ensure that Māori are able to contribute as full partners of Te Tiriti o Waitangi within myrtle rust research initiatives and participate in decision-making and activities at all levels, and that their unique contribution, including Mātauranga is valued.

C.1 Use of Mātauranga Māori to protect our myrtles and their ecosystems

C.2 Mātauranga based solutions and control tools to protect at risk species and ecosystems

C.3 Kaitiakitanga of taonga Myrtaceae

C.4 Whanaungatanga and international indigenous knowledge

Theme D: Socioecological complexity and socioeconomic consequences

To understand the socioecological complexity of myrtle rust in New Zealand, better understand opportunities for promoting improved managemen.t.

D.1. Biosecurity is a people problem

D.2. Effective engagement at multiple scales

D.3. Social and cultural licence

Theme E: Species conservation, disease control and management

To protect at-risk species, taonga trees and locations, and ecosystems, to develop and evaluate management tools to control myrtle rust and to protect valued myrtles and dependent ecosystems, and to evaluate the effectiveness of management actions.

E.1 Conservation strategies *including germplasm collection and preservation*

E.2 Control tools to protect at risk species and ecosystems

E.3 Long term management tools to protect at risk species and ecosystems *including selective breeding for resistance*

E.4 Management approaches, supporting infrastructure and protocols