Pathway for plant material to Exclusion & Containment Regions

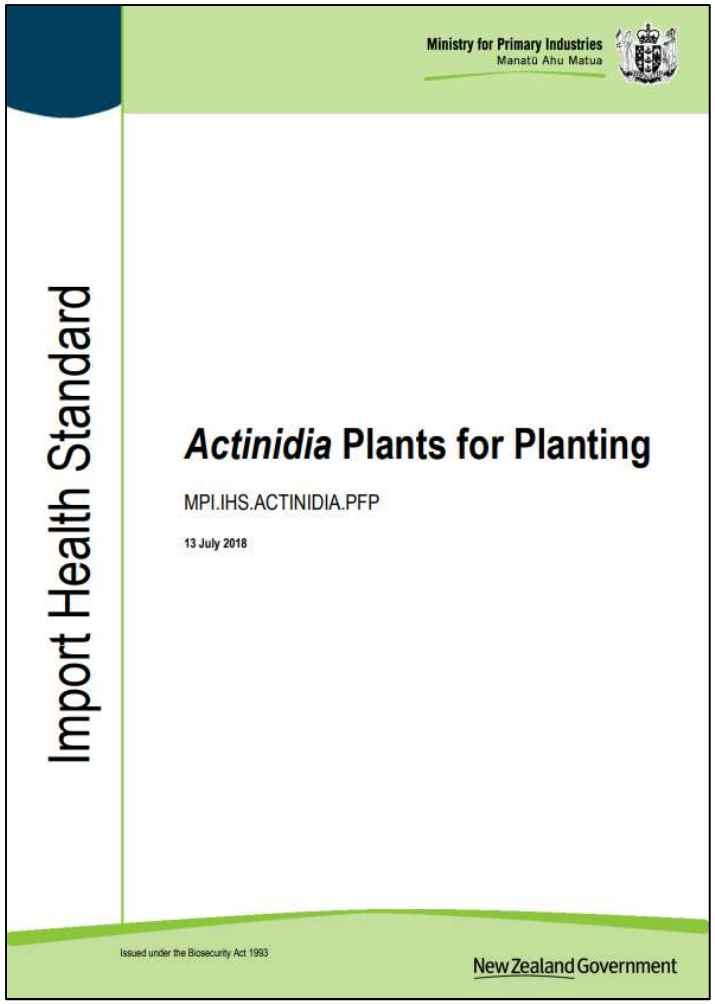
A plant pathway for all regions

- By creating a new pathway standard that continues to manage Psa risk, we can also enable more growers to access kiwifruit plant material, including new varieties.
- The standard will provide a robust, and strictly controlled pathway that allows material from Recovery regions to be moved to Exclusion or Containment regions, with little to no increase in Psa risk.

Why the change and why now?

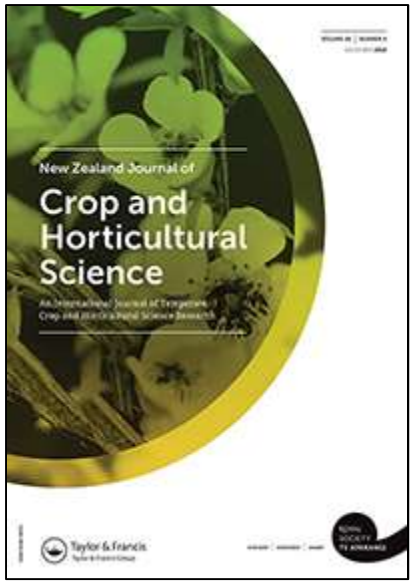
- Regional boundaries are important to protect areas with little or no Psa and manage risk from new or evolving forms of the bacteria.
- Growers have told us they want fairer and more equitable access to new cultivars or plant material.
- Movement of plant material from Recovery to Containment and Exclusion Regions prohibited under the NPMP
- KVH can introduce new controls only if consistent with National Psa-V Pest Management Plan
- Pathway must be robust and present a negligible increase in risk
- The standard uses the latest science and policy findings to provide growers with the access they want, while ensuring little to increase in risk.
- KVH has presented an earlier draft of this pathway previously with good grower support

Import Health Standard for *Actinidia* plants



- *Actinidia* plant imports closed since 2013
- Reopened July 2018, new IHS
- Allows import of tissue culture material from any country, provided requirements are met
- Two year quarantine process
- Robust measures to mitigate risk of all potential threats including Psa
- Provides model to manage risk with tissue culture plants

Publication of peptone screening method



NEW ZEALAND JOURNAL OF CROP AND HORTICULTURAL SCIENCE, 2017
https://doi.org/10.1080/01140671.2017.1414064

Taylor & Francis
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RESEARCH ARTICLE

Check for updates

Survival, growth and detection of *Pseudomonas syringae* pv. *actinidiae* in *Actinidia in vitro* cultures

Joy L. Tyson [a], Michelle J. Vergara[a], Ruth C. Butler [b], John F. Seelye[c] and Ed R. Morgan [c]

[a]The New Zealand Institute for Plant & Food Research Limited (PFR), Auckland, New Zealand; [b]The New Zealand Institute for Plant & Food Research Limited (PFR), Christchurch, New Zealand; [c]The New Zealand Institute for Plant & Food Research Limited (PFR), Palmerston North, New Zealand

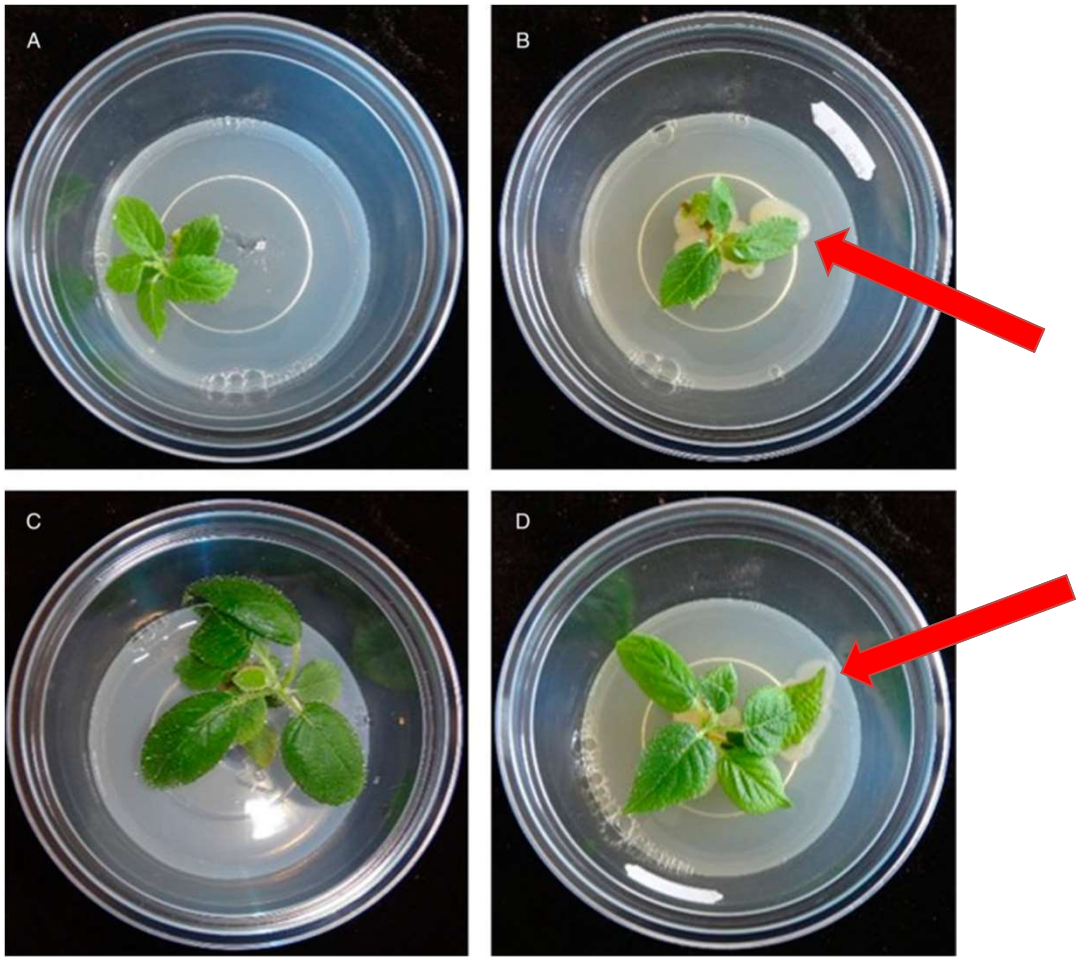
Psa is easily visible on peptone

Standard Media

Peptone (3g/L)

Hort 16A

Hayward



Low risk of repeat false negatives

inoculum conc. (cfu/mL)	plant section	*A. chinensis* var. *chinensis* 'Hort16A' cfu/0.1 mL (means of 5 plants) day 0	day 2	day 7	day 14	*A. deliciosa* 'Hayward' cfu/0.1 mL (means of 5 plants) day 0	day 2	day 7	day 14	*A. polygama* cfu/0.1 mL (means of 5 plants) day 0	day 2	day 7	day 14
BS control	Top	-	0	0	0	-	0	0	0	-	0	0	0
	Middle	-	0	0	0	-	0	0	0	-	0	0	0
	Base	0	0	0	0	0	0	0	0	0	0	0	0
10^2	Top	-	11	3201	1830	-	4	2141	800	-	0	0	3
	Middle	-	3	3200	2401	-	0	2438	800	-	0	0	343
	Base	0	3	3200	2403	0	1	1777	800	0	0	64	576
10^4	Top	-	802	4000	4000	-	1	1673	3200	-	0	911	1349
	Middle	-	179	4000	4000	-	186	1849	3200	-	3	1077	1984
	Base	35	2083	4000	4000	13	125	2430	4000	1	800	3423	4000
10^6	Top	-	1343	4000	4000	-	1607	585	3832	-	2	14	346
	Middle	-	2351	4000	4000	-	2834	2070	3994	-	6	857	2128
	Base	1172	4000	4000	4000	494	2814	4000	4000	213	1759	4000	4000
10^8	Top	-	4000	4000	4000	-	2104	4000	4000	-	68	2664	364
	Middle	-	4000	4000	4000	-	4000	4000	4000	-	355	3312	2610
	Base	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000

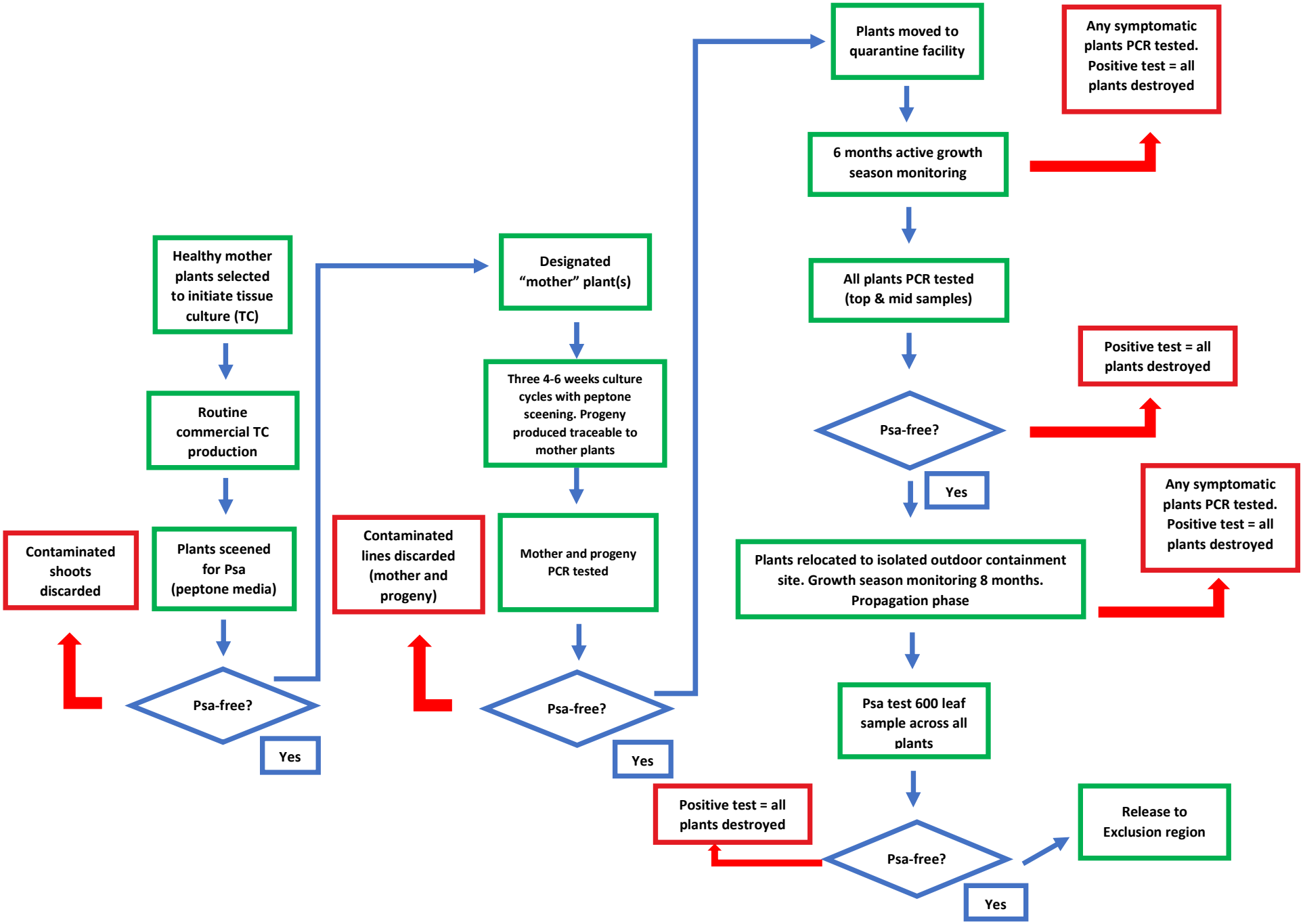
- Psa grows quickly, even if only extremely low levels are present
- Therefore while a false negative is possible, repeat negative results are extremely unlikely
- "*Once inoculum levels risk above c. 30 cu/ sample, the probability of getting a false negative is close to zero*" (Tyson *et al.* 2017)

Psa risk significantly reduced by the following:

- Three rounds of peptone screening
- PCR testing
- Any infected lines are discarded

And then for additional confidence:

- Quarantine glasshouse for 6 months
- More PCR testing
- Outdoor containment monitoring
- More PCR testing
- If any Psa is found at this point all plants are destroyed and we start again

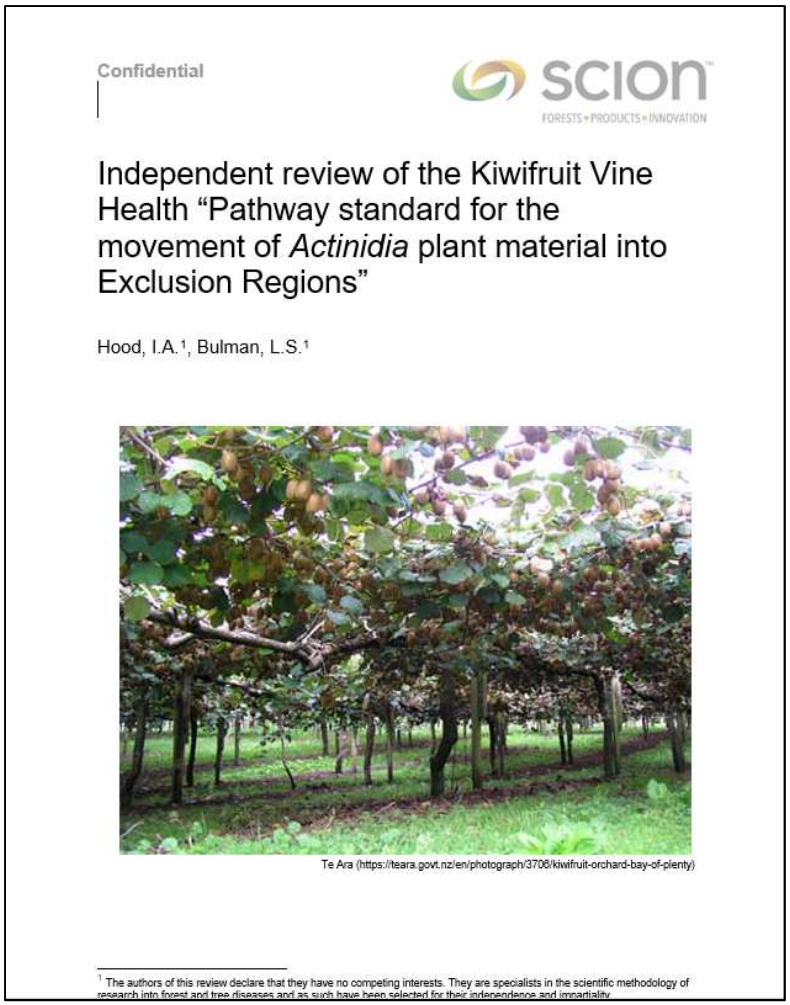

Healthy mother plants selected to initiate tissue culture (TC)
Routine commercial TC production
Plants sceened for Psa (peptone media)
Contaminated shoots discarded
Psa-free?
Yes
Designated "mother" plant(s)
Three 4-6 weeks culture cycles with peptone sceening. Progeny produced traceable to mother plants
Mother and progeny PCR tested
Contaminated lines discarded (mother and progeny)
Psa-free?
Yes
Plants moved to quarantine facility
6 months active growth season monitoring
Any symptomatic plants PCR tested. Positive test = all plants destroyed
All plants PCR tested (top & mid samples)
Psa-free?
Positive test = all plants destroyed
Yes
Plants relocated to isolated outdoor containment site. Growth season monitoring 8 months. Propagation phase
Any symptomatic plants PCR tested. Positive test = all plants destroyed
Psa test 600 leaf sample across all plants
Positive test = all plants destroyed
Psa-free?
Release to Exclusion region
Yes

Independent review

Conclusion

"The proposed protocol is thorough and meticulous containing multiple checks and backup reinforcement stages. It is concluded that the procedure outlined in the draft protocol reduces the risk of spreading Psa to a negligible level."

Ministry for Primary Industries
Manatū Ahu Matua



Confidential

SCION
FORESTS • PRODUCTS • INNOVATION

Independent review of the Kiwifruit Vine Health "Pathway standard for the movement of *Actinidia* plant material into Exclusion Regions"

Hood, I.A.[1], Bulman, L.S.[1]

Te Ara (https://teara.govt.nz/en/photograph/3706/kiwifruit-orchard-bay-of-plenty)

[1] The authors of this review declare that they have no competing interests. They are specialists in the scientific methodology of research into forest and tree diseases and as such have been selected for their independence and impartiality

Pathway	Movement controls	How could Psa enter?
Wind	N/A	Unlikely given more than >20km from other growing regions, severe spring storm?
Plant material	All plant material prohibited	Accidental or illegal movement possible
Machinery	Require cleaning and permission	Accidental or illegal movement possible
Beehives	Can't move direct from Recovery orchard to Exclusion	Accidental or illegal movement possible
Tools	Require cleaning and permission	Accidental or illegal movement possible
People, clothing and footwear	No KVH controls. Grower's manage orchard boundaries	Low, infected plant material could be transported this way
Fruit bins	Dedicated bins or closed loop	Low, system failure could result in spread
Proposed tissue culture pathway	Range of screening, testing and mitigation measures	Low, fraudulent practices or systemic failures in system not detected at audit possible

Take the opportunity to have a say

- We want to know what your views are and that the change is right for you.
- Speak to myself or any of the team, email or phone us, or check the KVH website.
- Consultation closes **Friday 2 November 2018.**
- Based on the feedback we receive the changes will come into effect from **Monday 12 November 2018.**

CATCH IT SNAP IT REPORT IT

REPORT THE UNUSUAL

CALL KVH **0800 665 825**