

Submission

to the

**Government Administration Committee 'B'
Sub-Committee**

Inquiry into Blueberry Rust

from the

**Department of Primary Industries, Parks,
Water and Environment.**

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Contents

Introduction	4
Blueberry Rust Disease Characteristics	4
The Generalised Invasion Curve	4
The <i>Plant Quarantine Act 1997</i>	5
Current Biosecurity Strategy	6
Inquiry Terms of Reference	8
I. The actions taken by Biosecurity Tasmania to address the 2014 and 2016 outbreaks of blueberry rust.	8
The 2014 Blueberry Rust Incursion	8
2014 Biosecurity Incident Management Team	10
Survey Methodology	10
Survey Results	12
First Infected Premises	14
Second Infected Premises (35IP)	14
Third Infected Premises (37IP)	14
The Decision-making Process: The 2014 Blueberry Rust Response.	15
The 2016 Blueberry Rust Incursion	18
First Infected Premises	20
Survey Work Conducted in 2016	20
Second & Third Infected Premises	21
The Decision-making Process: The 2016 Blueberry Rust Response.	21
Key Elements of the Containment Plan as of October 2017	24
Key elements of the plan are:	24
2. Past and present regulatory requirements relating to the blueberry industry in Tasmania	27
Legislative Status of Blueberry Rust	27
Infected Premises	27
Pest Free Place of Production	28
Market Access	28
Blueberry Orchard Guidelines for Domestic Export	29
3. The future of Tasmania's blueberry industry, including the impacts of previous, current and any future outbreaks of blueberry rust	30
Growth in Blueberry Production	30
Organic Production	31
Market Outlook	31
Impact of 2014 Outbreak	32
Impact of the Current 2016 Outbreak – Regulated Containment Approach	33

Impact if Blueberry Rust is Established in Tasmania.....	34
4. The capacity of Biosecurity Tasmania to manage blueberry rust outbreaks and other risks into the future	36
5. Any other matters incidental thereto.....	37
Appendix 1 – Overview of Collection of Plant Samples for Diagnosis.....	39
Appendix 2 – Blueberry Rust Fact Sheet	39
Appendix 3 – 2014 Infected Premises List.....	39
Appendix 4 – Macquarie Franklin Report	39
Appendix 5 – Advice from Dr Bernadine Strik	39
Appendix 6 – Advice from Tasmanian Institute of Agriculture (2016).....	39
Appendix 7 – Advice from Tasmanian Institute of Agriculture (2017).....	39
Appendix 8 – Advice from the NSW Department of Primary Industries 2017	39
Appendix 9 – Site Management Plan for Blueberry Growers with Blueberry Rust	39

Glossary

AIIMS	The Australasian Inter-Service Incident Management System – the nationally recognised system of incident management for the nation's fire and emergency service agencies.
Area Freedom	Absence of a specific pest in a specified location; demonstrated by business or State in order to secure trade of produce.
BIMS	The nationally recognised Biosecurity Incident Management System (BIMS) that provides consistency and an effective management framework for all biosecurity incidents.
Consignment	A discrete quantity of packages consigned to one business at one location at one time.
Dangerous Contact Premises	Premises that have, or have potentially, come into contact with diseased plant material.
Host plants	Any plants that produce a crop that is susceptible to blueberry rust infestation.
Infected Premises	Premises with a confirmed blueberry rust incursion.
ISPM10	A standard that specifies the requirements for the establishment of pest free places of production and pest free production sites.
Plant Biosecurity	Measures that protect the economy, environment and community from the negative impacts of plant pests. A fully functional and effective biosecurity system is a vital part of the future profitability, productivity and sustainability of Australia's plant production.
Pest Free Places of Production (PFPP)	A facility operating under a current agreement, which has been approved by DPIPWVE and each receiving state as being surveyed and found free of blueberry in accordance with ISPM 10.
Produce	Fruits that are a host of blueberry rust.
Property-level freedom accreditation	A property where surveillance activities have proven that it is free of blueberry rust.
Proof of Freedom	The status assigned to a property, region or State once surveillance activities demonstrate that a pest is absent.
Site Management Plan	A hygiene and biosecurity plan for an infected property designed to limit the chance of spread of blueberry rust off the property.
Surveillance	The processes that collect and record data on pest occurrence or absence by survey, monitoring or other procedures.
Quarantine	The system of measures that are used to minimise risks associated with the entry of pests.

Introduction

Blueberry Rust Disease Characteristics

Blueberry rust (*Thekopsora minima*) is a disease (See the Fact Sheet at Appendix I) that if left untreated can cause significant damage to host plants (including blueberries, cranberries & huckleberries) resulting in decreased fruit production, or in extreme cases plant death. To date in Australia blueberry rust has only been found on blueberry species. However, the literature indicates the disease has a more extensive host range including on other ericaceous plants such as *Rhododendron* species which exist in Tasmania.

Blueberry rust can also infect fruit thus having a negative impact on marketability. Once established, it can be managed with active and ongoing controls using fungicide applications. Blueberry rust poses no threat to human health.

The disease presents as small yellow spots on the surface of leaves. Yellow powdery pustules (1 - 10mm in size) form on the lower surfaces of the leaves and form small reproductive spores (microscopic in size), which can be carried by wind and water and can adhere to clothing and other items.

Surveillance teams can be directed to infected plants by pictorial guides. Early detection before the development of observable clinical symptoms, 7 - 21 days from initial infection requires complicated and expensive molecular testing.

Whilst rusts can produce up to five spore types during their life cycle, only one type (urediniospores) has been observed in Australia. These spores are produced in large numbers and can spread to neighbouring bushes and can reinfect the same plant. Spores can remain viable for several weeks in the absence of host material.

The disease is primarily a market access threat to the Tasmanian blueberry industry and is currently subject to Tasmanian biosecurity regulation as a notifiable plant pest. This means that anyone who sees what they think might be blueberry rust must report it.

The Generalised Invasion Curve

The Generalised Invasion Curve (Figure 1) is often used to describe the actions appropriate to each stage of an incursion of pests and diseases nationally and into Tasmania. It is widely used in Australia's biosecurity systems to demonstrate that prevention is the most cost-effective action and cost-effectiveness decreases as an event progresses through the stages of an incursion. It is also useful to describe the current and possible future phases of a response. This model was used as a basis for one of the policy principles in the Tasmanian Biosecurity Strategy: cost-benefit decision-making on control and eradication.

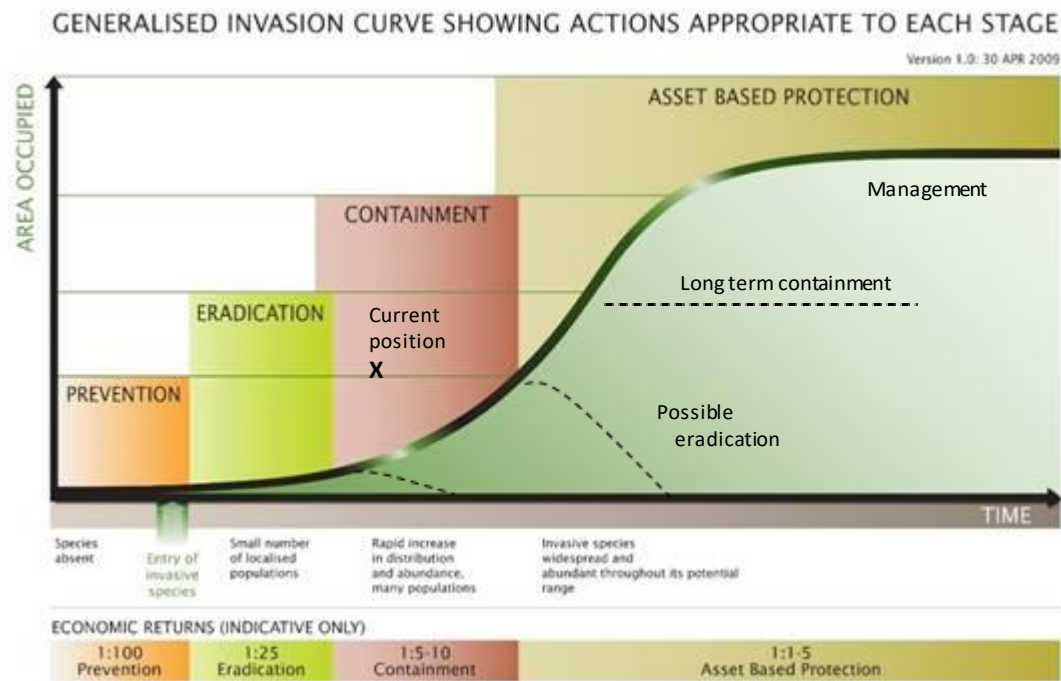


Figure 1 Generalised Invasion Curve

The Plant Quarantine Act 1997

The *Plant Quarantine Act 1997* is the key legislation that applies to the current blueberry rust situation. The Act provides for a number of actions to be taken to manage the disease including: its listing, restrictions around possession, movement, handling of plant material, control programs, powers of inspectors, importation, establishing quarantine, infected and control areas, and penalties for breaches of the Act.

The Act provides broad powers for the Secretary of the Department to make decisions relating to the management of plants pests under the Act including blueberry rust. Some powers can be delegated but in effect the Secretary makes the key decisions under the Act, especially in relation to management or eradication of pests and diseases.

One of the most significant regulatory powers imposed by the Act is the declaration of Infected Premises for containment of blueberry rust. Infected Premises must be managed in accordance with a Site Management Plan (see Appendix 9 for a Site Management Plan), enforced under a section 28 Direction. The Site Management Plan dictates biosecurity hygiene measures that must be exercised into, within and out of the infected area.

Declaration as an infected area means that any movement from the area of plants or plant products of *Vaccinium* species (including blueberry fruit) can only occur under a section 26 permit. To be granted a permit for the movement of blueberry fruit, the fruit must be treated. Treatments may include the pre-harvest treatment and inspection regime agreed to by trading States or freezing, cooking, juicing or freeze-drying the fruit. These methods will prevent the spread of viable blueberry rust spores on fruit.

Current Biosecurity Strategy

A regulated containment strategy is in place to manage blueberry rust in Tasmania that involves strict quarantine procedures on the three known infected properties. Table 1 below outlines the actions taken by Biosecurity Tasmania in both the 2014 and 2016 blueberry rust incursions.

Table 1 Timeline of both the 2014 & 2016 blueberry rust incursions

Actions Taken 2014 Incursion	Date
Blueberry rust was first detected at approved quarantine premises in Bridgewater	4 September 2014
Surveillance at other nurseries began, Direction Notices issued and suspect/infected plants deep buried	5 September 2014
Incident Management Team operational	15 September 2014
Destruction activities completed at 35IP	14, 15 & 19 January 2015
Destruction activities completed at 37IP	9 January 2015
Final Infected Property Identified	5 May 2015
Area Freedom declared	8 June 2016
Actions Taken 2016 Incursion	Date
Investigation and Alert Phase initiated after contact by Costas Group	9 August 2016
Blueberry rust was confirmed at Costa Sulphur Creek Farm (IIP)	10 August 2016
Direction Notice issued at Costa Sulphur Creek Farm	10 August 2016
Site Management Plan established at Costa Sulphur Creek Farm	17 August 2016
Infected Area Declaration issued at Costa Sulphur Creek Farm	8 December 2016
Surveillance Activities – exporting properties	9 November – 16 December 2016
Grower meeting/workshop to brief industry on situation	1 September 2016
Operational Phase continues until	31 October 2016
Stand Down Phase Commenced	1 November 2016
Containment Plan in Place	1 November 2016 – October 2017 (Ongoing)
Surveillance Activities – importing properties	20 December 2016 – 3 February 2017
2IP confirmed for blueberry rust	3 March 2017
3IP confirmed for blueberry rust	7 March 2017
Direction Notices issued at 2IP & 3IP	13 April 2017

Blueberry rust is currently being managed by regulated containment; a recognised approach to pest and disease incursions that focusses on limiting movement of the disease and putting in place the requirements to enable ongoing market access. The containment response includes:

- Strict quarantine measures on infected properties.
- Regular inspections of infected properties to ensure compliance with quarantine requirements.
- Ongoing surveillance of properties to confirm properties are disease free.
- Working with industry to ensure good on farm hygiene at non-infected properties to reduce the risk of disease spread.
- Working with trading partners to develop agreed protocols for market access for Tasmanian blueberries for this season and into the future.

It should be recognised that responses need to be flexible in approach. For example, although a response may be in the “regulated containment” phase, the possibility of eradication continues to

exist. Equally, the possibilities of long term containment or “transition to management” to the “asset protection” phase are future possibilities.

The Department will continue to review scientific information to inform its ongoing approach to the disease and will work closely with the blueberry industry as well as interstate authorities to maintain market access.

Inquiry Terms of Reference

I. The actions taken by Biosecurity Tasmania to address the 2014 and 2016 outbreaks of blueberry rust.

In both 2014 and 2016 outbreaks, Biosecurity Tasmania commenced a plant biosecurity emergency response consistent with the Biosecurity Incident Management System developed by the then Australian Government's Department of Agriculture, Fisheries and Forestry (now the Department of Agriculture and Water Resources).

The diagnostics to confirm blueberry rust were undertaken by Biosecurity Tasmania's Senior Plant Pathologist by morphological verification under the microscope at the Plant Health Laboratory in Newtown, Hobart.

The same organism and the same host crop were present in both the 2014 and 2016 incursions. However, the characteristics of each incursion were different and consequently the responses to each were developed subject to the specific circumstances at the time.

The 2014 Blueberry Rust Incursion

The 2014 blueberry rust response was characterised as follows:

- A formal response structure was imposed using the Biosecurity Incident Management System.
- The size of the outbreak was small – despite there being 54 infected premises, most were single or small plantings in domestic backyards with two small commercial properties affected, and the number of infected plants was low (hundreds).
- Trace-back on infected plants was confirmed early to a single nursery source in Victoria.
- Infected plants were stopped from being distributed and rapid recall of other consignments of potentially infected plants occurred quickly.
- The rapid detection and low numbers of infected plants also meant that there was limited exposure in the environment for uninfected blueberry plants. This enabled a window for eradication by quick destruction of remaining plants.
- A public campaign to find infected plants had a good response and identified diseased plants in backyard gardens.

Following awareness of the presence of the blueberry rust incursion, it was necessary to determine the extent and its distribution. This was undertaken both through 'trace-back' investigations (determining the source of the disease, likely pathways, number of incursions, number of sources from origin, etc.) and 'trace-forward' investigations (identifying the number of incursions, whether multiple incursions from multiple sources were present, and determining how far the disease had spread).

This information, combined with an assessment of the technical feasibility of eradicating blueberry rust, was used to determine the appropriate management response. In all responses, this could range from eradication through to containment through to management.

Blueberry rust was first detected at approved quarantine premises (Fresh Freight Tasmania, 59 Cove Hill Road, Bridgewater) in the south of Tasmania on 4 September 2014 during a routine wholesale nursery inspection by Biosecurity Tasmania. This site became known as IIP (or the first 'Infected Premises'). The infected plants had all been imported from one wholesale nursery in Victoria.

The map below shows where surveillance was conducted during the 2014 response and the infected premises known at the end of the operation in June 2016.

Blueberry Rust - 2014 Incursion

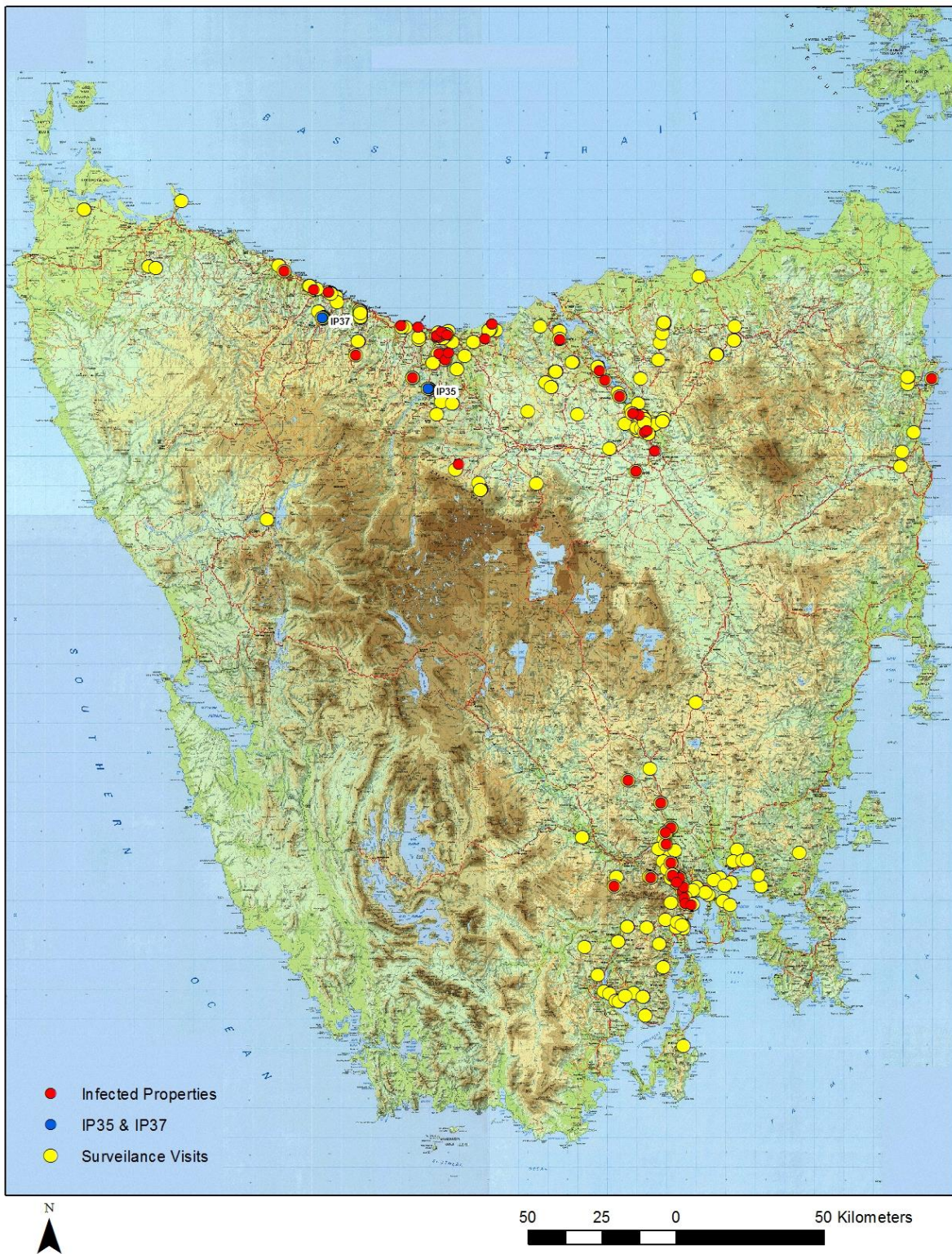


Figure 2 Map showing surveillance and infected premises incl. IP35 and IP37 – 2014 Incursion.

2014 Biosecurity Incident Management Team

The biosecurity response in both 2014 and 2016 was deployed using the Biosecurity Incident Management System (BIMS) developed by the Australian Government Department of Agriculture, Fisheries and Forestry. BIMS is recognised nationally as the best practice approach to management of biosecurity emergencies.

The first step involved formation of an Incident Management Team (IMT) that was functional by 15 September 2014. The IMT elected to manage the response as a Level 2 operation under BIMS. The IMT operated under a weekly Incident Action Plan (IAP) and Reporting (SitRep) schedule.

The IMT consisted of an: Incident Controller, Planning Manager, Field Coordinator, Operations & Logistics Manager, Public Information Officer, Administrative Officer, an Industry Representative from Fruit Growers Tasmania and the Chief Plant Health Manager (Chief Scientist) from Biosecurity Tasmania.

The Response Strategy focused on:

1. Developing high levels of community and industry awareness of blueberry rust and the Response and encouraging reporting of suspect symptoms;
2. Containing the known incursions to Dangerous Contact Premises, identifying the supply chain and achieving eradication at infected premises;
3. Preventing the spread of infection to, and confirming absence of infection from, commercial propagation and production sites; and
4. Regulating the entry pathway (i.e. imported nursery stock and blueberry fruit) to prevent further incursions.

Survey Methodology

Two survey methodologies were used during the response:

1. Planned surveillance focused on retail nursery, wholesale nursery, fruit production, and propagation properties, and
2. Surveillance responding to public reports.

Appendix 3 contains the full list of Infected Premises after Area Freedom had been declared at the time the Response was finalised in July 2016.

The 2014 Trace-back Operations

Trace-back procedures in cooperation with Fruit Growers Tasmania identified 23 consignments with over 548 blueberry plants from three interstate nurseries imported to Tasmania since 30 June 2014. Only one nursery was identified as the source nursery.

2014 Trace-forward Operations

Trace-forward operations involved identifying retail nurseries that had infected plants. Fifteen Tasmanian nurseries were identified as a high risk of having imported product from the source nursery.

Location of all imports of blueberry plants from the source Victorian nursery since 1 July 2014 was attempted.

Planned Surveillance

The survey design was informed by “The International Standards for Phytosanitary Measures” (ISPM). Planned surveillance activities were prioritised, with Dangerous Contact Premises (DCP) identified by tracing imported plants from the source nursery in Victoria receiving first priority. Potted blueberry and alternative host plants were inspected at garden centres and wholesale nurseries.

As surveillance on those properties was completed, surveillance teams moved to properties, identified as being commercial retail or wholesale nurseries, commercial blueberry fruit production or blueberry plant propagation, as the next priority.

An initial list of commercial premises was obtained from industry representative bodies and then expanded through Biosecurity Officers’ local knowledge and identification while surveying other growing properties. Surveillance was planned and carried out for all identified properties.

Plant samples submitted for analysis by Biosecurity Plant Pathologists were prepared and packaged according to a standard operating procedure (SOP) developed by Biosecurity Tasmania (Appendix I).

Where the population of blueberry plants numbered fewer than 250 plants, all plants in the population were checked for signs of disease. As the population size increased, the number sampled attenuated. For example, in populations of plants that numbered 25 000 (and upwards), 600 plants were sampled. The sample size was calculated so that Biosecurity Tasmania had a 95% degree of confidence in sampling that had only a likely 4% error. This protocol is a well-recognised statistically based standard for biosecurity inspections used at national and international levels.

Surveillance Responding to Public Reports

Additional surveillance activities focused on residential or ‘backyard’ blueberry plants reported by the public. Awareness of the rust was raised via print, online and broadcast media outlets. This included a call for any person who had blueberry plants with blueberry rust symptoms or who had purchased new blueberry plants since April 2014 to contact Biosecurity Tasmania.

Members of the community who knew of another person who had new blueberry plants were also encouraged to have that person contact Biosecurity Tasmania. Some media outlets, such as the ABC Radio’s Gardening Talkback segment, proved very effective in this regard.

Biosecurity Officers also obtained ‘loyalty club’ customer details from a number of retail nurseries, who were able to identify the purchase of blueberry plants and conduct follow-up calls with those customers. In instances where blueberry plants were reported with possible disease symptoms, surveillance staff attended the property to physically inspect the plants.

Information, including identification resources, was maintained on the Biosecurity Tasmania website under the ‘Current Threats’ and ‘Plant Biosecurity’ channels. The Tasmanian Biosecurity Advisory and Facebook channels were also used to promote awareness and increase public surveillance efforts.

Surveillance Team Establishment and Training

All surveillance field team members received induction training from Biosecurity Tasmania Plant Pathologists and Data Management staff on identification of the rust, biosecurity hygiene procedures, sampling procedures, and data collection and management procedures prior to deployment.

Team composition aimed to have staff with plant biosecurity backgrounds alongside staff with experience in surveillance and data collection processes to increase effectiveness of teams.

Surveillance teams, and their members, were designated as either ‘commercial’ or ‘public reports’ to minimise biosecurity risks from potential cross contamination by staff acting as a vector for the disease.

Staff who came into contact with diseased plants were not redeployed on the same day and decontamination procedures were followed upon entry and exit to properties in accordance with a SOP on property biosecurity hygiene. Another SOP on field surveillance activities was also in effect.

Online material, including the training material, public information resources and SOPs and Incident Action Plans, were maintained on the Biosecurity Tasmania intranet to support staff involved in the Response.

Data Management

Spatial data was collected via GPS units and downloaded into Biosecurity Tasmania's 'Invasive Species Database' (ISDB). The ISDB accommodated 'point' data (infected plants and premises) and track logs (survey tracks) to be recorded.

A 'Naming Convention for GPS Data' was developed to ensure standardisation of spatial data collection and storage.

Operational activities were also recorded on paper-based 'running sheets', which were then scanned and retained by the Operations Manager. These documents, plus planning and reporting documents, have been transferred to the Department's document management system. (This information makes up several thousand pages of records.)

Survey Results

The results of surveillance activities were:

- 204 properties inspected;
- 54 Infected Premises identified and all 'resolved' i.e. cleared of infection through removal of infected materials and decontamination;
- Some properties were visited more than once with a total of 360 property visits, 289 samples taken and 131 positive assessments made for blueberry rust;
- Average diagnostic time was recorded as 2 days (with a range of 0 -10 days for confirmation);
- Surveillance staff completed 232km of transects (not including surveillance on residential properties; and
- 127 public reports were received and investigated.

Forty-two of the IPs were 'residential' – property owners had purchased plants from the infected retail nurseries. No commercial propagation nurseries were found to be infected. Two small commercial properties were found to be infected, with trace-back linkages to infected retail nurseries.

Data collection during planning and operational activities identified 56 commercial growing premises and 39 fruit production sites. Thirty-one sites were designated as 'dangerous contact premises' having been identified as receiving stock from the source IP in Victoria.

All known commercial growing properties were surveyed. The quantities of plants identified and surveyed on the properties is outlined in Table 2.

Table 2 Plant quantities identified and surveyed during the 2014 Response

Property Type	Total Blueberry Plants	Blueberry Plants Closely Inspected	Host Plants Inspected
Commercial Growers (Nurseries)	351 292	52 629	
Retail & Public Sector	6 571	6 565	9 981
Commercial & Wholesale Nursery Site	105 380	18 952	
Fruit Production Sites	245 912	33 677	
TOTALS	709 155	111 823	9 981

Residential Premises Management

Residential IPs were managed by removing all blueberry plants from the properties. This was achieved by a mixture of informed consent from the owner to immediately destroy plants without diagnostic confirmation or by a Direction Notice being issued to prevent interference with the plants and contain the biosecurity risk while waiting for diagnostic confirmation.

Properties with suspect plants were controlled under a *Plant Quarantine Act 1997* Direction to prevent movement of plants or potential contamination of people or equipment on the property.

No large commercial production or propagation premises were found to be infected, noting that 35IP and 37IP were smaller commercial properties where the owners did generate an income from blueberry fruit production but did not engage in export activities or have commercial contracts for supply in retail chains.

All Infected Premises were identified as bringing in plants sourced from other IPs and ultimately traced back to the source nursery in Victoria.

Market Access

Detection of the disease in Tasmania resulted in automatic loss of area-freedom based market access to markets in Victoria and Western Australia due to the loss of recognised 'Area Freedom' from blueberry rust. Blueberry rust has been established in New South Wales and Queensland for many years and have no import requirements for blueberry rust or its hosts.

Victoria and Western Australia's requirements meant conventionally produced blueberry fruit could be exported if the crops had been appropriately treated with crop protection products. However, some smaller producers were exporting organically produced blueberries and thus were not able to meet the chemical requirements

To regain market access for these producers, Biosecurity Tasmania negotiated 'property-level freedom accreditation schemes' (PFAS) for growers wishing to export to specified interstate markets. PFAS were negotiated with Western Australia and Victoria during the Response and were used by growers who had surveillance completed on their properties. At this time South Australia did not have regulations in place in relation to blueberry rust but have since implemented requirements similar to those of Victoria.

First Infected Premises

As noted earlier, blueberry rust was first detected at Approved Quarantine Premises (Fresh Freight Tasmania, 59 Cove Hill Road, Bridgewater) in the south of Tasmania on the 4 September 2014 during a routine wholesale nursery inspection by Biosecurity Tasmania. This site became known as IIP (or the first 'Infected Property'). The infected plants had all been imported from one wholesale nursery in Victoria (Humphris). These plants were subsequently not released from the Approved Quarantine Premises consistent with quarantine protocols.

Subsequent investigations indicated the same nursery had exported blueberry plants to Tasmania over previous months. Trace-forward investigations identified infected plants from these shipments had gone to wholesale and retail nurseries in Tasmania and had been sold in the retail market.

A total of 54 Infected Premises were identified with the majority being residential premises. No susceptible plants, other than blueberry plants, were found to be infected. All Infected Premises were linked, via the transfer of blueberry plants, back to the original Victorian nursery through tracing activities. Surveillance activities were conducted on a total of over 200 properties. This included all commercial growing properties identified from industry and departmental sources including those located during other surveillance activities. Infected Premises were subject to destruction activities to safely remove and destroy the infected and other host plants.

Second Infected Premises (35IP)

Blueberry rust was confirmed at a small commercial premises at Barrington (35IP) on 4 December 2014 and destruction activities occurred on 14, 15 & 19 January 2015 to remove approximately 414 plants from three blocks. A fourth block that was rust free, containing 60 plants and approximately 500m away, was not destroyed.

Third Infected Premises (37IP)

The third IP discovered to have blueberry rust was a small commercial property at Ridgley (37IP) on 17 December 2014. Initially the property was considered for management under a spray treatment regime and an initial treatment of fungicide was applied. However, the IMT re-evaluated the risk posed by the property and eradication activities were conducted. Overspray of copper sulphate by a contractor occurred at this site and as a consequence certain non-target species were damaged or destroyed.

On 9 January 2015, removal and destruction of all blueberry plants onsite was undertaken. Approximately 682 plants, including propagation material, were removed and stems treated with herbicide to ensure plants would not re-sprout. All plant material, fruit and mulch were removed and bagged from around the base of the plants and taken to the Dulverton approved quarantine waste facility for deep burial.

With the exception of the root systems removed by the owner of 37IP, all plant material was 'double-bagged' and destroyed under the supervision of a Biosecurity Officer via deep burial at the Dulverton approved quarantine waste facility. On 37IP, the owner undertook the removal of the root balls himself and subsequently burnt the material onsite.

On completion of destruction activities, a new Direction was issued for both 35IP and 37IP under the Plant Quarantine Act that effectively placed both properties under a Property Management Plan. The Plan restricted specified activities for a further eight weeks and required the property owners to advise Biosecurity Tasmania if re-planting of blueberry plants was planned.

Area Freedom Status surveys were conducted at all commercial farms and propagation facilities on two occasions during the 2014-15 summer period, and all premises other than IP35 and IP37 were negative for blueberry rust.

The Decision-making Process: The 2014 Blueberry Rust Response.

After analysis of trace-back and trace-forward investigations and technical assessment of the disease organism, consideration of a response to the blueberry rust incursion was made to determine whether eradication or a long-term management approach should be taken. The responsibility for decision making lies with the Secretary of the Department and was made after careful consideration of the following information.

An eradication approach was selected based on factors including:

- Limited time period of entry of potentially infected blueberry plants (since July 2014) prior to detection in September 2014.
- Trace-back investigation indicating all plants were sourced from one infected nursery in Victoria.
- Victorian investigations confirming blueberry rust was only present at that one nursery and that multiple nursery entry pathways were unlikely.
- Relatively low numbers of blueberry plants imported from that nursery with indications of a low infection rate (approximately 10%).
- Subsequent survey work conducted in Tasmania indicative of no non-blueberry host detections or occurrences, suggesting the incursion was restricted to blueberry plants.
- No blueberry rust was detected at any of the large commercial/export farms in Tasmania.
- Consequences of not attempting to eradicate were likely to be significant for an expanding state berry industry.
- Once established, it would be unlikely that blueberry rust could be eradicated from Tasmania.
- Physical removal and destruction of infected and associated blueberry plants was operationally feasible.

An eradication feasibility assessment was conducted consistent with PLANTPLAN (VI.0 5 December 2013). Table 3 demonstrates that the majority of factors were in favour of eradication (highlighted).

Table 3 Determination for eradication

Factors Favouring Eradication	Factors Favouring Alternative Action
<p>Cost/benefit analysis shows significant economic loss to industry or the community if the organism established.</p> <p>Yes – establishment of blueberry rust in Tasmania is likely to impose an ongoing cost burden for management and interfere with existing and future potential trade in blueberry fruit from Tasmania.</p>	<p>Cost/benefit analysis shows relatively low economic or environmental impact if the organism establishes.</p>
<p>Physical barriers and/or discontinuity of host between production districts.</p> <p>Yes – not physical, but taking account of specificity of the rust disease, there are not continuous</p>	<p>Major areas of continuous production of host plants.</p>

Factors Favouring Eradication	Factors Favouring Alternative Action
plantings of blueberries and thus it may be possible to treat individual infected sites.	
The generation time, population dynamics and dispersal of the organism favour more restricted spread and distribution.	<p>Short generation times, potential for rapid population growth and long-distance dispersal lead to rapid establishment and spread.</p> <p>Yes – though climatic conditions restrict development of the rust under favourable conditions, it can develop quickly e.g. infection to pustules in 10 days.</p>
<p>Vectors discontinuous in distribution and can be effectively controlled.</p> <p>Partly – wind is primary risk and concern, and control is limited. In some situations, wind breaks would interfere with spore movement, but largely wind poses the greatest uncontrolled movement risk. Physical movement by humans can be controlled through entry restrictions.</p>	<p>Vectors unknown, continuous in distribution or difficult to control.</p>
<p>Outbreaks few and confined.</p> <p>Yes – this is the case at present with traces all back to a single Victorian source. The number of infected plants number in the hundreds compared to the tens of thousands of blueberry plants surveyed and found to be clear of the disease.</p>	<p>Outbreaks numerous and widely dispersed.</p>
<p>Trace-back information indicates few opportunities for secondary spread.</p> <p>Yes – single source identified with that pathway being stopped following detection via suspension of trade with Tasmania.</p>	<p>Trace-back information indicates extensive opportunities for secondary spread.</p>
<p>Weather records show unfavourable conditions for pest development.</p>	<p>Weather records show optimum conditions for pest development.</p> <p>Yes – conditions of last few weeks have been ideal for development, helping detection but increasing risk of uncontrolled vectoring of the disease.</p>
<p>Ease of access to outbreak site and location of alternative hosts.</p> <p>Yes – all sites easily accessed and investigations suggest the rust is highly specific to blueberry plants.</p>	<p>Terrain difficult and/or problems accessing and locating host plants.</p>

Factors Favouring Eradication	Factors Favouring Alternative Action
Pathways for reintroduction from international trade closed. Yes – not applicable internationally, but domestically imports of blueberry plants are restricted.	Pathways for reintroduction from international trade open.

Options considered at the time of making the decision to eradicate blueberry rust in January 2015 were:

1. Halt response if any further incidences of disease occur and declare blueberry rust to be endemic in Tasmania;
2. Continue with current response but do not respond to any further incidences of disease; and
3. Continue with current response and respond to any new detection through removal and destruction of infected plants using Direction Notices issued under the *Plant Quarantine Act 1997*.

Each option was also considered in terms of possible future scenarios, in terms of its efficacy, feasibility, cost effectiveness and industry impact, and an assessment was made as to whether it was a recommended approach or otherwise.

Option 3 was the chosen option and was based on the proviso that additional, larger IPs were not detected and the factors supporting eradication were maintained.

Surveillance activities were conducted through the summer period with no new infestations discovered.

Biosecurity Tasmania held a debrief on the Response in February 2015 that included DPIPWE staff involved in the Response and that also considered written comment from members of the IMT.

The Fruit Growers Tasmania representative on the IMT was an apology but did make a written submission to the debrief.

Based on tracing intelligence, Biosecurity Tasmania was confident that blueberry rust had been eradicated to below detectable levels and area freedom was sought through the national processes for that decision following development of a “Proof of Freedom” package by Biosecurity Tasmania. Area freedom was agreed to by all Australian States and Territories and declared on 8 June 2016.

The 2016 Blueberry Rust Incursion

The 2016 blueberry rust response was characterised by the following features:

- Initial reporting of blueberry rust to Biosecurity Tasmania by Costa Group occurred, on the 9th August 2016, 4 - 6 weeks after suspected plant samples were sent by Costa Group in Tasmania to a 'sister' property in NSW – instead of the Biosecurity Tasmanian Plant Diagnostics laboratory, as had been the arrangement during the 2014 response with all potentially affected plant material. The Costa Group indicated this occurred because management at the property in question in 2016 were not familiar with the 2014 arrangement or reporting procedures for biosecurity threats.
- A Direction Notice under the *Plant Quarantine Act 1997* was issued on 10 August 2016 and on 8 December 2016 an Infected Area Declaration was issued.
- The size of the outbreak was much larger than in 2014. The number of plants potentially infected on IIP was over 150 000 plants once leaf dormancy on deciduous plants had broken.
- No trace-back was possible and the source of infection still remains unknown, with speculation that the pathway for entry was potentially an unregulated one, such as windborne, or on clothing or equipment.
- An Incident Management Team (IMT) was formed that met regularly (approximately 3 times/week) and an update to growers was distributed after those meetings via the Fruit Growers Tasmania representative who was part in the group, as well as other communication activities that Biosecurity Tasmania undertook.
- An Incident Response Plan finalised in October 2016 was used as a guide for the Response.
- Biosecurity Tasmania considered a number of sources to inform its management approach to the 2016 incursion that included: advice from the Tasmanian Institute of Agriculture, a benefit/cost analysis report by Macquarie Franklin, advice (commissioned by Costa Group) from Dr Bernadine Strik, Biosecurity Tasmania's internationally recognised expert in plant fungal pathogens such as blueberry rust and Biosecurity Tasmania's internal assessment of the incident.
- Following requests by grower representatives Biosecurity Tasmania undertook a review of the decision making process made in 2016. The advice received in 2017 from the Tasmanian Institute of Agriculture and the NSW Government supported the regulated containment decision made by Biosecurity Tasmania.
- Two subsequent infected premises were confirmed for blueberry rust on 3 March 2017 and 7 March 2017 approximately 10km south west of IIP in the locality of Stowport. The two additional premises have around 100 plants each and are within 300m of each other.
- The two new premises (2IP & 3IP) were not previously known to Biosecurity Tasmania, as they had not come forward during previous community engagement by Biosecurity Tasmania for growers to identify themselves and were not known to industry representatives.

There is no direct evidence to suggest the 2016 incursion is linked to the 2014 incursion, although it cannot be ruled out.

As of 25 October 2017, there are a total of three infected sites in the State that are managed under Site Management Plans, imposed under infected area declarations made under the *Plant Quarantine Act 1997*. Biosecurity Tasmania will manage and audit the three infected premises regularly.

2016 Response Phases:

- Investigation and Alert phase: Initiated 9 August 2016.
- Operational phase: 10 August – 31 October 2016.
- Stand down phase: Initiated on 1 November 2016.

The map below shows where surveillance was conducted during the 2016 response and the infected premises known as at 25 October 2017.

Blueberry Rust - 2016 Incursion

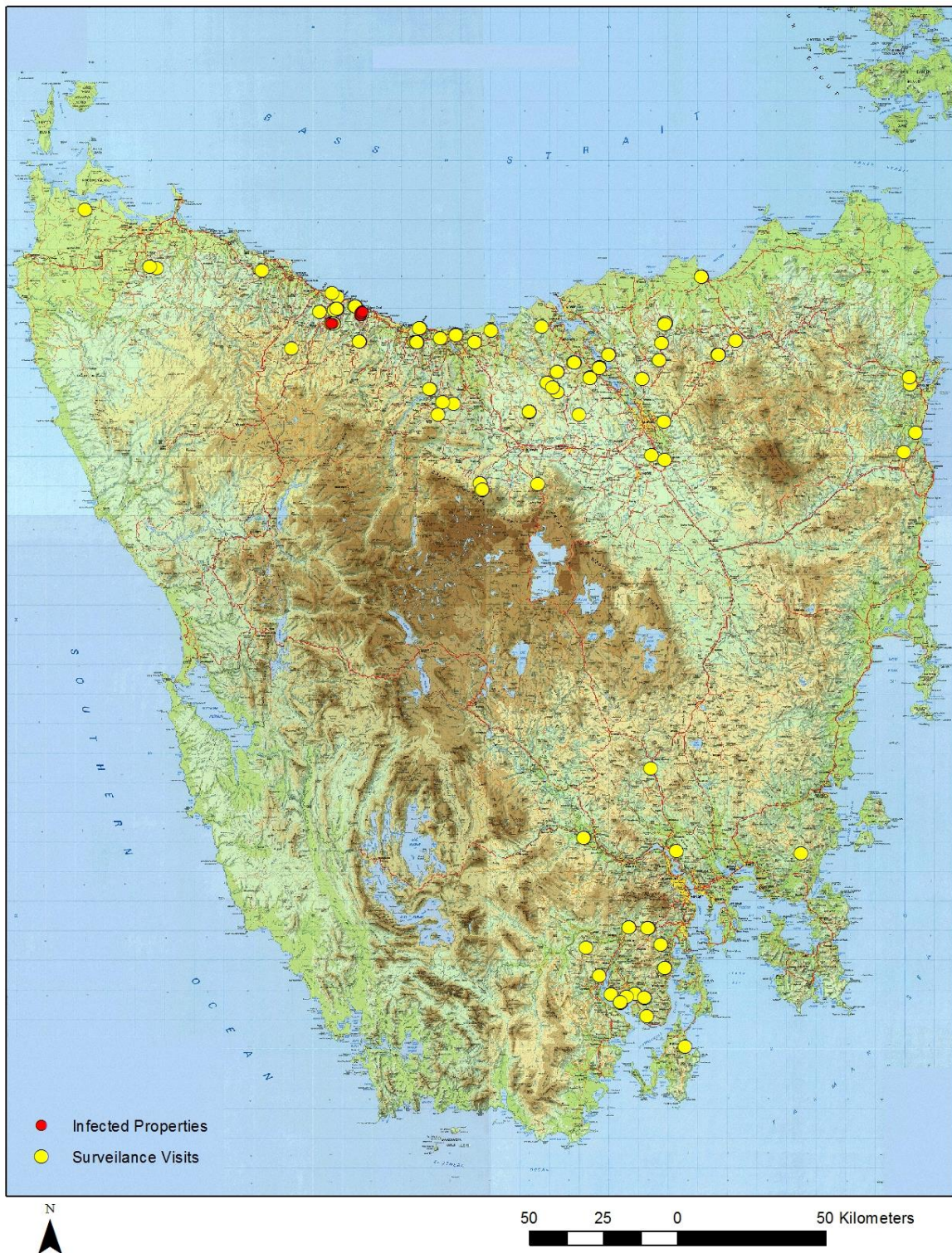


Figure 3 Map showing surveillance and infected premises – 2016 Incursion.

First Infected Premises

On 10 August 2016, an incursion of blueberry rust was confirmed at Costa's Sulphur Creek Farm (IIP), a large commercial property in the north-west of Tasmania. Initial diagnosis was made by the Elizabeth Macarthur Agricultural Institute in NSW and subsequently confirmed by Biosecurity Tasmania's Dr Ziqing Yuan, a nationally recognised expert on fungi.

Survey Work Conducted in 2016

A delimiting survey was conducted consistent with the nationally endorsed framework developed by Plant Health Australia. The delimiting surveillance covered a total of 63 properties, which at the time accounted for 100% of known blueberry fruit production sites in Tasmania. There were two distinct phases to the survey based on first assessing for blueberry rust at export properties and then at non-exporting properties.

The delimiting surveillance plan had two functions:

1. To determine the presence or absence of blueberry rust in Tasmania outside IIP; and
2. To establish property freedom claims in support of export fruit trade to mainland Australia from disease-free sites.

Surveillance priorities

Priorities were as follows:

- To cover those production sites intending to export fruit in the 2016-17 fruiting season;
- In the north-west region, surveillance priority was applied outwards from IIP;
- Production and nursery sites within 25km of IIP had already been surveyed and found free of blueberry rust. These sites were denoted as Provisionally Negative Premises and did not require re-surveillance;
- Two At Risk Premises linked to IIP required re-survey; and
- Two Provisionally Negative Premises in northern Tasmania required re-survey for export.

Surveillance activity was conducted in accordance with the 'Blueberry Rust Field Surveillance Standard Operating Procedure' and the 'Blueberry Rust Sampling Technique' provided to field workers in field kits in each region.

Table 4 Blueberry rust survey work undertaken in 2016

Surveillance Activities	Phase 1 – Exporting Properties 9 November – 16 December 2016	Phase 2 – Non-Exporting Properties 20 December 2016 – 3 February 2017
Properties surveyed	23 (21 producers and 2 nurseries)	40 (35 producers, 1 producer/ nursery, 2 nurseries and 2 gardens)
Total number of plants on inspected properties	209 661	84 913
Number of plants inspected	27 936	15 912
Samples taken	11	2

Surveillance Activities	Phase 1 – Exporting Properties 9 November – 16 December 2016	Phase 2 – Non-Exporting Properties 20 December 2016 – 3 February 2017
Positive samples	0 (not including 2 & 3 IPs)	0 (not including 2 & 3 IPs)
Negative samples	11	2
Field staff who conducted activities	31	27
Total (approx.) number of work hours	521	372
Public reports received	0	0
Properties declared as Infected Properties	0 (not including 1, 2 & 3 IPs)	0 (not including 1, 2 & 3 IPs)
Properties declared as Provisionally Negative Properties	23	35
Properties ‘At Risk’ but deemed as Provisionally Negative Properties	1	1

Second & Third Infected Premises

Two further infected properties were discovered, initially through contact from the owner of 2IP informing Biosecurity Tasmania that they had blueberry plants close to the Costa’s site. From the visit to 2IP, a lead to 3IP was discovered. 2IP and 3IP are both within a 25km radius of 1IP.

On 3 March 2017, Biosecurity Tasmania staff visited 2IP and issued a Direction Notice.

On 7 March 2017, Biosecurity Tasmania staff visited 3IP and issued a Direction Notice.

Both sites (2IP and 3IP) are producers for the local farmers’ market trade including small ‘pick your own’ farm gate operations for the local community. These two sites do not export on the national domestic market nor do they intend to and have not traded at all since confirmation of the disease.

The Decision-making Process: The 2016 Blueberry Rust Response.

The 2016 incursion was treated as a new incursion for several reasons; including that Area Freedom had been declared and that after extensive surveys it was believed that blueberry rust had been eradicated.

The response included a delimiting survey that characterised the incursion through detailed and extensive surveillance of other blueberry enterprises, trace back analysis to identify possible pathways of entry and subsequent trace forward analysis to identify pathways of possible spread.

Sourcing and consideration of other information arising from these analyses, including scientific, technical and economic feasibility information, was also critical in determining both the technical and economic feasibility of each management possibility. It is standard practice in all biosecurity responses both in Tasmania and nationally to undertake the delimitation phase to ensure action, which may have significant impacts on producers or could damage industry are not taken unnecessarily.

During this ‘delimitation phase’, Direction Notices were issued at 1IP to contain the known incursion while these activities are undertaken.

The window in which there was potentially the opportunity to eradicate blueberry rust on IIP was small; from 10 August 2016 until the breaking of dormancy of deciduous plants. Even within that window, removal and deep burial of infected plants would have been a significant logistical exercise and very costly, with no guarantee of successful eradication from the site.

After breaking leaf dormancy, removal and deep burial of large numbers plants at IPI would have been almost impossible. The decision was made by the Secretary of the Department after careful consideration of all information at hand that eradication was not feasible. This was supported by Biosecurity Tasmania's own assessment and advice provided by the Tasmanian Institute of Agriculture.

Following the decision that eradication was not feasible, a regulated containment plan was developed to prevent further spread of disease from the three infected premises. This is consistent with the nationally accepted Generalised Invasion Curve (Figure 1) whereby containment is the appropriate approach to take when eradication is not possible and the pest or disease is not widespread.

Subsequent assessments on technical feasibility by experts in Biosecurity Tasmania, the Tasmanian Institute of Agriculture and New South Wales Department of Primary Industries during 2017 again supported Biosecurity Tasmania's decision that eradication was not feasible and that the containment approach was the most suitable strategy for the incursion.

A technical feasibility assessment table modified from the National Environmental Biosecurity Response Agreement (NEBRA) has been proved below to assist in explaining part of the decision-making process. The following table was used to assess the circumstances surrounding the 2016 incursion and was developed in July 2017. In undertaking a technical feasibility analysis, **all** the following criteria must be considered.

Highlighted text supports containment program.

Table 5 Part of the decision-making process made in the 2016 blueberry rust incursion

Criteria	Is there sufficient information to answer? If not, what further information is required?
The capability to accurately diagnose or identify the pest or disease	Straightforward laboratory diagnostic protocols are available. Strains of rust related to specificity can be identified. Symptoms once advanced are distinctive on blueberry plants, though earlier stages of infection can be confused with other diseases. Dormancy through colder seasons complicates diagnosis and surveillance.
The effectiveness of the control technique options, including a recommendation on the control technique likely to be the most cost-effective in eradicating the pest or disease	Chemically based management options exist to act as protectants to uninfected plants and to reduce sporulation only. There are no chemical options to cure infected plants. Mechanical options exist for removal and destruction of infected and buffer plants for small numbers of plants early in an incursion. The latter approach is prohibitive in the current circumstance with a large number of plants on multiple properties carrying infection and potentially infected plants.

Criteria	Is there sufficient information to answer? If not, what further information is required?
The level of confidence that all individual pest/disease organisms present (including at all life stages) can be removed/destroyed by the recommended control techniques	Initial detection involved a very large number of exposed plants (IIP). In addition, high levels of infection detected at 2IP and 3IP, at the end of the season, combined with extensive movement of people off and on properties prior to detection, suggests very high probability that spores have moved to other locations. Alternative hosts species exist in Tasmania. Although no disease has been found in non-blueberry species, it is unknown whether other species are clear of the disease.
The level of confidence that it is possible to remove the organisms at a faster rate than they can propagate until the population is reduced to a non-viable density	The physical number of plants involved and the time to address through mechanical destruction would see sporulation occurring in areas before being addressed.
Confirmation that the recommended control techniques are publicly acceptable (taking into consideration cultural and social values, humaneness, public health impacts, non-target impacts and environmental impacts)	Mechanical destruction of plants, in most cases, can have a significant impact on the business enterprise involved, is highly expensive and could impact significantly on industry viability (more impact than the actual disease if applied widely). Such an approach should only be considered if small numbers of plants are involved, as in 2014.
Interim control measures that have been put in place by the notifying party	Immediate regulatory controls on sites and appropriate site management activities can reduce rate or potential of disease spread, notwithstanding that spores can be transported by natural means e.g. wind.
Endemic pest or disease controls that may limit or prevent establishment	Standard fungicidal regimes can manage the disease if applied appropriately. Currently in Australia, there are three registered options though one will lose registration soon, placing pressure on rotational capacity. Rotation of fungicide groups is essential to minimise disease resistance being selected for.
Any legislative impediments to undertaking an emergency response	Effective legislative frameworks available to support eradication or containment attempts.
Resources required to undertake an emergency response	Due to the extensive numbers of plants involved and potentially involved, resource demands would be extremely high.
The known area of infestation (post discovery of IP 2 and 3.)	Three Infected Premises have been identified, but the likelihood that spores have not spread beyond the sites cannot be determined until 2017-18 survey activities are completed.
The likely distribution of the pest or disease	Three Infected Premises defined, but certainty that spores have not spread beyond the sites cannot be known until 2017-18 survey activities are completed.
Identification of the pathways for the entry into and spread within Australia of the pest or disease	Entry pathways into Tasmania are both regulated and known. However, unregulated pathways (unable to be regulated), such as people movements, pose a significant ongoing threat.

Criteria	Is there sufficient information to answer? If not, what further information is required?
The level of confidence that further introductions are sufficiently low	Given the apparent low level of farm biosecurity in the national industry and the extent of people movement direct from infected areas to uninfected areas in the State, confidence is low.
The dispersal ability of the organism (that is, whether the organism is capable of rapid spread over large distances)	The fungal pathogen sporulates extensively and is adapted to fast spread via fomites and natural forms of dispersal, primarily wind.
Surveillance activities that are in place or could be put in place to confirm proof-of-freedom for sites possibly infested by the pest or disease	This is resource-intensive, but design of such a system is being finalised and an operation will be run across 2017-18, primarily to establish property freedom for exporters as a basis for market access (to VIC, SA and WA).
The community consultation activities undertaken	Consultation is occurring directly with industry. Farm hygiene practices are being promoted as a mechanism to assist containment.

As well as the information contained in the above table, the following sources of advice were used to determine that a science-based and well-implemented containment strategy that involved all industry members was the most effective way of managing blueberry rust in Tasmania:

- An Appreciation document prepared by Biosecurity Tasmania (29 September 2016);
- A Report commissioned by Biosecurity Tasmania from Macquarie Franklin (*Blueberry Rust Economic and Social Impact Study*, October 2016) (Appendix 4);
- Advice sourced by the Costa Group from Dr Bernadine Strik (2 October 2016) and provided to Biosecurity Tasmania (Appendix 5);
- Advice from the Tasmanian Institute of Agriculture, 12 October 2016 & 27 July 2017 (Appendix 6 & Appendix 7); and
- Advice from the NSW Department of Primary Industries (Appendix 8);

Key Elements of the Containment Plan as of October 2017

Key elements of the plan are:

- All three Infected Premises are under legal directions under the *Plant Quarantine Act 1997*.
- All premises have Site Management Plans that are monitored by Biosecurity Tasmania via regular and random inspections. Plans are reviewed on an ongoing basis.
- Restrictions have been imposed on movement of risk materials from those sites including fruit, host plants, equipment, machinery, and workers clothing.
- Chemical treatment requirements or limited plant destruction will reduce the risk of spread or movement from areas of infection.

Site Management Plans for Blueberry Growers with Blueberry Rust

The 3IPs each have different factors that influence management of blueberry rust, so while a consistent approach to management is being taken where possible, each site has a tailored Site Management Plan.

Each Site Management Plan aims for effective management of blueberry rust on-site, and to minimise the chances of spreading the rust to other sites, and carry-over to the next season of production. The Site Management Plans are used in conjunction with Direction advice placed on the property by Biosecurity Tasmania.

Example of Quarantine controls that can be implemented on infected properties

- Entry to orchards is controlled and includes: wash down of all vehicles and tools; footbaths and work clothing to remain onsite; and a site map that identifies where these activities are to occur.
- On exit from orchard, full decontamination of vehicles in an approved wash-down area, and clothing and tools, is required.
- Fruit harvest is allowed with strict hygiene measures (e.g. fruit from infected plants not to leave property without freezing at required temperatures).
- Prunings must be buried in an approved manner – recorded and mapped.
- Spray regimes are documented for audit purposes.
- Monitoring occurs weekly and checks of all plants are made by Biosecurity Tasmania staff.

Standard operating procedures (SOPs) were developed to assist property owners comply with quarantine and hygiene requirements that cover the following:

- Hygiene protocols for entering and leaving the Quarantine Area (gear up in biosecurity hygiene Personal Protective Equipment, and remove and decontaminate when leaving).
- Pruning of blueberry plants.
- Managing green waste.
- Site maintenance such as mowing.
- Fungicide application.
- Vehicle and agricultural machinery decontamination.
- Applying bird netting.

Farm Hygiene Program

The Department worked with Fruit Growers Tasmania (FGT) and other blueberry growers to develop a farm hygiene program for berry growers. An allocation of \$65 000 was made available to FGT to administer the program on behalf of all growers.

In July 2017 the Department launched a Farm Hygiene Grants Program specifically targeted to the Tasmanian blueberry industry. The program was developed with industry input to provide small grants to support growers to transition management practices to mitigate and manage biosecurity risk within their businesses. Examples of measures supported through the program include installing signage, gate locks, spray equipment and foot baths. The program is being delivered via Fruit Growers Tasmania on behalf of the State Government.

In addition to the Grants Program two Biosecurity for Blueberry Growers workshops were delivered in September 2017. The workshops had 36 participants were designed to specifically raise awareness of biosecurity management and the importance of farm biosecurity planning and were delivered by AgriGrowth Tasmania working with Biosecurity Tasmania and TasTAFE.

Participants were provided with practical information and tools to support them to develop and implement plans in their businesses. Many participants have subsequently used the information gained through the workshops to inform how they have used the grant funds through the Farm Hygiene Grants Program.

Through 2017 AgriGrowth Tasmania officers have been engaging with representatives of the blueberry industry to maintain awareness of issues and opportunities relating to industry development.

Following discussions between TIA and DPIPWE and TIA participation at the Biosecurity Workshops for Blueberry Growers TIA has developed a fact sheet on blueberry rust management and is developing a RD&E plan for blueberry rust research.

In October funding of \$310 000 to the TFGA was announced for a four-year State-wide On-farm Biosecurity Program to support farmers to raise awareness of good on-farm biosecurity, encourage discussion and provide farmers with strategies to manage biosecurity risks, for example through developing their own individual biosecurity plans.

Continued Surveillance

Continued surveillance will cover the entire industry. State-wide surveillance of all production properties will occur before the picking season and twice during the picking season. In addition, surveillance will occur specifically on exporting properties to confirm property freedom for trading purposes subject to negotiations with interstate trading partners. Surveillance for blueberry rust is documented under a specific protocol.

2. Past and present regulatory requirements relating to the blueberry industry in Tasmania

Legislative Status of Blueberry Rust

Thekopsora minima (blueberry rust) is currently declared as a List A disease under the *Plant Quarantine Act 1997*. This applies to organisms of a biosecurity threat to the State but that are absent from the State. There is a process under the Act that enables blueberry rust to be listed as a List B disease – a plant disease that is a biosecurity threat to Tasmania but is localised and under official control. In due course, that listing is to be considered as appropriate to the current situation in Tasmania

The *Plant Quarantine Act 1997* is the key legislation that applies to the current blueberry rust situation. The Act provides for a number of actions to be taken to manage the disease including: its listing, restrictions around possession, movement, handling of plant material, control programs, powers of inspectors, importation, establishing quarantine, infected and control areas, and penalties for breaches of the Act.

Infected Premises

The most significant regulatory requirements are those currently imposed on Infected Premises for containment of blueberry rust.

Infected premises have been or will be (refer to following Table) declared as an Infected Area with conditions and restrictions on the movement of plants and plant products pursuant to sections 23 and 24 of the *Plant Quarantine Act 1997*.

Infected areas must be managed in accordance with a Site Management Plan, enforced under section 28 Direction. The Site Management Plan dictates biosecurity hygiene measures that must be exercised into, within and out of the infected area.

Declaration as an infected area means that any movement from the area of plants or plant products of *Vaccinium* species (including blueberry fruit) can only occur under a section 26 permit. To be granted a permit for the movement of blueberry fruit, the fruit must be treated. Treatments may include the pre-harvest treatment and inspection regime agreed to by trading States or freezing, cooking, juicing or freeze-drying the fruit. These methods will prevent the spread of viable blueberry rust spores on fruit.

Infected Area Declarations will remain in place so long as a containment approach to blueberry rust is taken or until eradication can be achieved on those sites. For infected premises that include commercial production areas as well as residential property, an infected area will only be declared over the area where there are blueberry plants, where possible. This prevents regulatory requirements impacting on the everyday life of the property owner (such as the simple act of leaving the property).

During the 2014 outbreak, infected premises were managed under regular Directions (section 56, *Plant Quarantine Act 1997*) rather than Infected Area Declarations as they were under regulation for shorter periods of time. The table below shows the current status of the three regulated properties.

Table 6 Current regulatory status of the three infected properties

Property	Approx. number of blueberry plants	Direction Notice under the <i>Plant Quarantine Act 1997</i>	Site Management Plan established	Infected Area Declaration under the <i>Plant Quarantine Act 1997</i>
IIP	150 000	10 August 2016	17 August 2016	8 December 2016
2IP	100	13 April 2017	13 April 2017	Pending as of 18 October 2017
3IP	100	13 April 2017	13 April 2017	Pending as of 18 October 2017

Pest Free Place of Production

For the 2017-18 fruiting season, market access, at the time of writing, is under negotiation and is subject to the requirements expected by trading States. For commercial producers free of blueberry rust, a trade agreement is under negotiation based on a 'Pest Free Places of Production' (PFPP) approach. The format of this agreement is based on ISPM10 and includes surveillance as the basis for declaring properties as PFPPs.

PFPPs will be expected to make an undertaking to manage the property under basic farm biosecurity hygiene requirements. For infected premises, trade has again been negotiated based on pre-harvest treatment and inspection. The protocol is intended to cover the trade of fresh blueberry fruit, not plant material.

Under the PFPP protocol, businesses trading with domestic markets must register with Biosecurity Tasmania. Registered businesses are required to implement a Farm Biosecurity Plan, as a requirement of the registration process. The plan must provide measures to mitigate the risk of the disease entering the PFPP.

Market Access

During the 2014 and 2016 incursions, Biosecurity Tasmania negotiated market access to regulated domestic mainland markets based on 'property freedom' status from blueberry rust on exporting properties.

In 2016, an additional trade agreement was developed for IIP to supply blueberry fruit to the domestic mainland market based on pre-harvest treatment and inspection.

IPs 2 & 3 listed in the above table each have approximately 100 blueberry plants. At the time of writing, IP3 had no plans to sell any fruit products from their orchard, which was not actively maintained for fruit production. IP2 is an organic property where 'pick your own' arrangements had been in place before the 2016 incursion. No fresh blueberries can be moved from this property. Fruit will need to be treated as per the Site Management Plan. Treatments may include freezing, cooking, juicing or freeze-drying the fruit. These methods will prevent the spread of viable blueberry rust spores on fruit.

IPI currently exports blueberries under a *Trade Agreement – Pre-harvest Treatment and Inspection of Blueberries for Blueberry Rust*. This agreement was in operation for the 2016-17 export season and is currently being negotiated for the 2017-2018 export season (mid-December 2017 – late May 2018).

Fruit grown, treated, harvested and packed on IPI and the associated packaging facility in East Devonport is only eligible for export under this trade agreement. The agreement specifies procedures that must be followed relating to pre-harvest spraying, harvesting, inspections of product and

equipment, grading and packaging, records and document control, and auditing procedures. It includes sanctions for failure to comply with the agreement.

All registered PFPPs must implement a Farm Hygiene Program that addresses risk pathways associated with the entry of blueberry rust onto the property.

All registered PFPPs will be subject to a surveillance regime to confirm property freedom from blueberry rust that will be conducted over the export season. A statewide surveillance program of all blueberry production sites from October 2017 to confirm that disease remains confined to the three current infected premises in the north-west of the State will occur. Surveillance visits will be conducted three times during the growing season – from leaf establishment through to harvest.

Blueberry Orchard Guidelines for Domestic Export

Biosecurity Tasmania has developed *Blueberry Orchard Hygiene Guidelines Tasmania, Blueberry Rust (Thekopsora minima) 2017 - 18 plant and plant product export season – For export of Vaccinium plants and fruit to mainland domestic market*.

This guideline is for blueberry production orchards operating under the Pest Free Places of Production (PFPP) protocol and are relevant to blueberry orchards that are free from blueberry rust and wish to retain property freedom status for this disease.

These guidelines are considered the minimum standard of farm hygiene for all blueberry producers who are registered with Biosecurity Tasmania for trade with Victoria, South Australia and Western Australia under the PFPP.

Active on-farm hygiene supports interstate market access with assurance that Tasmania is undertaking biosecurity measures on each site to avoid the spread of blueberry rust in Tasmania.

All registered exporters must commit to continuing or commencing good on-farm biosecurity hygiene in accordance with these guidelines to support their status as a PFPP for the 2017-18 export season.

The guidelines provide advice concerning: farm biosecurity, hygiene, farm imports and exports, people, vehicles and machinery, production practices, record keeping and the regulatory requirement that notification to Biosecurity Tasmania is required under the *Plant Quarantine Act 1997* as soon as possible when any suspected signs or symptoms of blueberry rust are observed.

3. The future of Tasmania's blueberry industry, including the impacts of previous, current and any future outbreaks of blueberry rust

Growth in Blueberry Production

There is no single publicly available data source that accurately quantifies the number of blueberry growers and total blueberry production in Tasmania. However data released from the Australian Bureau of Statistics (ABS) agricultural census on 7 July 2017 shows the Tasmanian blueberry industry had grown from 28ha producing 100 tonnes of fruit worth \$2.6 million in 2010-11 to in excess of 104ha producing 678 tonnes of fruit worth \$15.4 million in 2015-16¹.

Expansion in blueberry production is part of a general expansion in berry production in Tasmania, increasing more than sixfold (by volume) over five years to be worth an estimated \$64 million in 2015-16.² By value, berries have increased from 18% of the value of Tasmanian fruit production in 2010-11 to 38% in 2015-16. They are second only to cherries, which were also worth \$64 million after rounding.³

In 2010-11, blueberry production was concentrated in the north of the State (75% bearing area, 61% of production) and the south (25% bearing area, 39% production). There was no production in the north-west at that time. By 2015-16, the focus of production had shifted to the north-west where higher yields are achieved (51% bearing area, 61% of production), followed by the north (32% bearing area, 24% production) and the south (17% bearing area, 15% production) (see Figure 4).

Blueberries have grown in value at an average annual rate (year on year) of 46.5% in the five years to 2015-16. In this period, 73% of growth has come from new plantings in the north-west of the state, largely established by Costa. The average yield from farms in the north-west is 20% higher than the state average (see Figure 5).

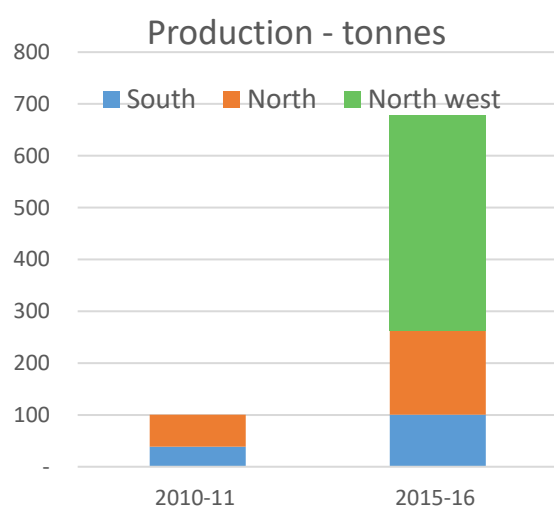


Figure 4 Tasmanian blueberry production

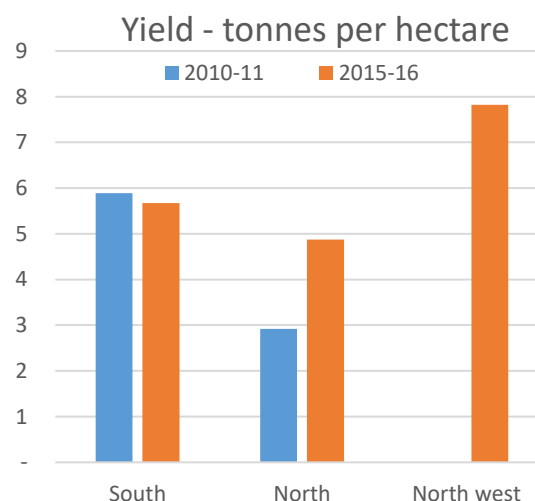


Figure 5 Tasmanian blueberry yields

¹ 2015-16 data was released on 7 July 2017 and was not available during the incursions. 2015-16 is likely to be an underestimate relative to 2010-11 as it is based on data sourced from farm businesses with an Estimated Value of Agricultural Operations (EVAO) of \$40,000 or more. 2010-11 data is sourced from businesses with and EVAO of \$5,000 or more. Blueberry production data was not separately reported between 2010-11 and 2015-16.

² Value derived from Horticulture Innovation Australia (HIA) data.

³ Based on data published by HIA.

The majority of Tasmanian grown blueberries are sold interstate. A small proportion (1%) is exported overseas.

New South Wales produces the vast majority of Australian blueberries (6 600 tonnes), with peak production from July to January. Tasmania is the second largest producing Australian state (or territory) and supplies the market from January to April.⁴

Australia is a net importer of fresh blueberries and currently imports approximately 1 000 tonnes of fresh blueberries mainly from New Zealand. Blueberries are imported from December to April each year when NSW supply is low. An opportunity exists for Tasmanian blueberry production to expand further and replace imports.⁵

Reports from industry indicate that Tasmanian blueberry production is expanding at present by approximately 18% per annum.

Organic Production

During the 2014 incursion, Biosecurity Tasmania identified 43 commercial blueberry growers in Tasmania with a total bearing area of 113ha. Nineteen of these growers had fewer than 1 000 plants. Eleven of these growers produced blueberries under organic or pesticide-free production systems. Based on information available at the time, organic producers accounted for 7% of blueberries produced in Tasmania and 8% of the value of blueberry production. It was reported that 62.5% of organics were sold interstate (4% of Tasmanian blueberry production by volume and 5% by value).

Market Outlook

There is no reason why the future of Tasmania's blueberry industry should be anything but strong. Regardless of whether blueberry rust is eradicated, contained or established in Tasmania, a Tasmanian blueberry industry can continue to operate and grow. The NSW industry has prospered in spite of blueberry rust being present there for over a decade. Even if it were possible to eradicate blueberry rust, outbreaks in future are likely as spores can spread by many vectors and by natural wind dispersal. While all measures are being taken, it is not possible to regulate every pathway for the disease.

With the use of crop protection products, blueberry rust is not a production constraint but rather a market access problem for businesses wishing to trade to States that regulate for the disease. Victoria, South Australia and Western Australia all currently regulate for blueberry rust but accept fruit from infected areas subject to conditions based on chemical treatment regimes during production. Blueberry rust is not so much an issue for conventional growers, but it can be significant for certified organic growers as they cannot use the chemicals without losing their organic status. It is likely that property freedom certification will provide a means by which the organic sector can maintain market access. Victoria and South Australia are the primary markets for organic Tasmanian exported fruit. Western Australia is a lesser market. New South Wales and Queensland do not regulate for blueberry rust, as it is established there. Assuming establishment of blueberry rust in Tasmania, the primary focus of Biosecurity Tasmania is undertaking work to maximise chances of blueberry export market access.

⁴ Horticulture Innovation Australia, *Australian Horticultural Statistics Handbook 2015-16*.

⁵ *ibid*

Impact of 2014 Outbreak

Properties Impacted

There were 54 infected properties (IP) identified following the 2014 outbreak. The majority of these (42 locations) were residential premises. Two were small commercial growers (35IP and 37IP), one was a freight forwarding facility and the remainder were plant nursery sites (see Figure 2).

All infected properties had their blueberry plants removed. Of the two small commercial growers, the first at Barrington (35IP) was initially considered for management under a treatment regime. However, following an initial treatment of fungicide in December 2014, Biosecurity Tasmania re-evaluated the risk and eradication activities were begun. The second grower was identified in December 2014 at Ridgley (37IP) and again, eradication was begun. Eradication activities were completed at 37IP and 35IP in January and February 2015 respectively. It amounted to several hundred plants at both properties, but in both cases the majority of plants on site were destroyed and therefore it had a significant impact on these two individual growers businesses. In the case of 37IP, there was also unintended damage caused to certain non-target plants by the eradication activities.

Following eradication both properties were under a property management plan that restricted specified activities and required them to advise Biosecurity Tasmania if re-planting of blueberry plants was planned.

Ex-Gratia and Other Payments

There are no statutory compensation mechanisms in the event of plant based biosecurity events and under the *Plant Quarantine Act 1997* such compensation is specifically excluded. Ex gratia payments are discretionary payments that can be made that are not due to a legal obligation or for the supply of a good or service. Ex gratia payments are usually made by the Government to individuals or organisations who have suffered a loss due to a particular negative circumstance but do not constitute any form of concession or admission of liability by the Government.

The hardship suffered by two growers (35IP and 37IP) during the 2014 outbreak was exceptional as most of their productive blueberry plants were destroyed. Ex-gratia payments were made to each of these growers. The payments were made on 15 December 2016.

A further settlement payment was paid on 7 December 2016 to one of these growers (37IP) as a consequence of non-target species being damaged or destroyed as a result of the eradication activities.

Impact on Market Access

The primary impact from the 2014 outbreak on the local industry was the loss of area freedom status for Tasmania and consequential loss of access to national markets. For the previous decade or more, Tasmania had enjoyed area freedom status for blueberry rust which meant the State was certified by Tasmania's Chief Plant Health Manager to be free of the disease. These certifications are ratified by a national Plant Health Committee under the Commonwealth Department of Agriculture and Water Resources. Under area freedom status, the export of blueberries from Tasmania to mainland States was unrestricted.

Following the loss of area freedom, the export of blueberries from Tasmania required agreements for individual properties to supply into the regulated markets of Victoria, South Australia and Western Australia. Supply into NSW and Queensland, where blueberry rust is established, was not affected unless consignments travelled through Victoria. The agreements with the rust-free States were under a Property Freedom Accreditation Scheme (PFAS) which Biosecurity Tasmania negotiated on behalf of Tasmanian growers with each of those States. These agreements were negotiated for the 2014-15

season and then again for the 2015-16 season. In 2014-15, there were eight registered businesses exporting and for 2015-16 there were 12 businesses. Each of their properties required inspection and certification that they were free of the disease.

The trade agreements were reached and permits were issued to the individual businesses from those States to import. All businesses that requested market access through PFAS gained it. No additional treatment of the produce was required and those properties were able to export to all mainland markets for those years.

Impact of the Current 2016 Outbreak – Regulated Containment Approach

Blueberry rust was again detected in Tasmania in August 2016. The outbreak followed immediately on from Tasmania regaining area freedom in July 2016 after extended surveillance activity by Biosecurity Tasmania through 2015-16 gathered the required evidence for the Chief Plant Health Manager to compile 'proofs of freedom' documentation and successfully gain area freedom recognition from other States. The outbreak once again saw a loss of area freedom and market restrictions placed on Tasmania by other States.

Following the initial response, the decision was taken to opt for a regulated containment approach to the outbreak as feasibility of eradicating the disease based on all factors was deemed not possible. This option is available and used nationally and is run for a period of time to enable industry and markets to adjust to the change in status. During the application of such a containment program, restrictions apply to IPs in much the same way as they do in an eradication response. Similarly, if new IPs are discovered, restrictions apply. Containment plans and accompanying restrictions are designed to mitigate the spread of the biosecurity threat and don't preclude localised eradication of the disease. They also allow the opportunity for all stakeholders to adjust to the possible ongoing presence of the disease.

Properties Impacted

There are currently three infected premises all within 25km of one another in the north-west of Tasmania. The largest is at Sulphur Creek (IIP) and the other two at Upper Stowport (2IP and 3IP). 2IP and 3IP are within 500 metres of one another (see Figure 3).

The three infected premises are subject to the Containment Plan which requires each to have a Site Management Plan. The requirements and the impacts of the SMPs on these properties is detailed under TOR 1 in this submission.

Impact on Market Access

The overriding impact of the 2016 outbreak on the local industry again relates to market access for growers. As was the case for the 2014 outbreak, agreements had to be negotiated with the rust-free states for the 2016-17 season to enable local, mainly organic, growers to access those markets. In 2016-17, the process was similar to the previous years for the rust-free properties. Twenty-three exporters, including rust-free properties belonging to IIP as well as three certified organic growers and others with organic principles, were able to gain access to the regulated mainland markets in this way. The infected property of IIP required a separate trade agreement that required the property to apply pre-harvest chemical treatments.

For the upcoming 2017-18 season, arrangements have been successfully negotiated with Victoria and South Australia under a more rigorous process based on the International Standards for Phytosanitary Measures (ISPM10) called 'Pest Free Places of Production' (PFPP). Similar arrangements are still under negotiation with Western Australia and are expected to also be successful. Under these arrangements,

there will be additional requirements on growers to undertake on-farm biosecurity measures including access controls, clean-down requirements, and record keeping in relation to those entering properties. Though the measures should be a normal part of the operation of such a business, some producers may not have the required processes in place. In response the Department launched a Farm Hygiene Grants Program in July 2017 specifically targeted to the local blueberry industry. The program was developed in consultation with industry to provide small grants to support growers transition to the new requirements and help mitigate and manage biosecurity risk within their businesses. Examples of measures supported through the program include installing signage, gate locks, spray equipment and foot baths. Two workshops titled Biosecurity for Blueberry Growers were also delivered in September 2017 to industry participants to supplement the Grants Program. The program is being delivered via Fruit Growers Tasmania on behalf of the Government. Further details are provided under TORI.

Biosecurity Tasmania expects that as many as 28 exporters (including 3 Costa sites and probably around 10 exporters following organic principles) will join the process in order to gain access to regulated markets. However, Biosecurity Tasmania will first be required to confirm the extent of the disease in Tasmania. Blueberry rust surveillance for the upcoming 2017-18 season will occur in accordance with the Biosecurity Tasmania Blueberry Rust Surveillance Protocol.

The purpose of the surveillance will be to:

- determine presence or absence of blueberry rust in Tasmania outside of known Infected Premises; and
- establish property freedom claims in support of export fruit trade to mainland Australia from disease-free sites.

The surveillance protocol specifies three rounds of surveillance. The first round has already begun on properties where there is sufficient leaf growth to inspect for symptoms. The second round will occur during the season and the third will be towards the end of the picking season.

The surveillance protocol will cover all commercial blueberry properties in Tasmania, whether they intend to export fruit or not. Nurseries are not specifically included unless a nursery intends to supply propagation material into mainland States, requiring market access for regulated markets.

Impact if Blueberry Rust is Established in Tasmania

The major issue with establishment of blueberry rust will be ongoing access to regulated markets. Unregulated markets such as Queensland and New South Wales will accept fruit even if it is affected by blueberry rust. Successful blueberry industries in these states are able to access the Tasmanian and other regulated markets despite the presence of blueberry rust.

Organic blueberry growers will be most significantly impacted by blueberry rust establishing in Tasmania. Victoria and South Australia are the primary markets for organic Tasmanian exported fruit; Western Australia is a lesser market. If special long-term market access agreements cannot be put in place, growers producing blueberries organically for export into these States would lose their interstate market access. Organic orchards may be able to apply organic fungicides; however, it would be necessary to ensure this was done in compliance with protocols and labelled use.

Growers producing blueberries via conventional production systems will be able to retain access to regulated markets provided they can undertake the necessary chemical applications. However, production costs may increase for both conventional and organic producers as a result. In this respect, it will be important to set up the Interstate Certification Assurance (ICA) Scheme in Tasmania to enable producers to self-treat and self-certify their own fruit under ICA 31. This scheme operates nationally for the movement of plants and plant products. The scheme has not been set up in Tasmania

because there has never been a significant demand given that Tasmania enjoys area freedom from a range of pests and diseases of biosecurity concern. Setting up the scheme would be managed by Biosecurity Tasmania as the auditor.

4. The capacity of Biosecurity Tasmania to manage blueberry rust outbreaks and other risks into the future

In preparing for, and responding to, outbreaks such as blueberry rust, Biosecurity Tasmania adopts the guidance and direction provided by the Biosecurity Incident Management System (BIMS) developed by the Australian Government's Department of Agriculture and Water Resources. Adoption of BIMS is expected to lead to efficiencies in preparedness activities, such as planning, training, exercising, as well as enhancing the existing pool of human resources available from other agencies that may be able to assist in emergency responses. BIMS provides the framework for sector-specific incident response arrangements, such as AUSVETPLAN and PLANTPLAN.

BIMS classifies biosecurity incidents from Level 1 (localised and minor) to Level 5 (major and an international response required). The two blueberry rust outbreaks were classified as Level 2, where the capacity and resources within Biosecurity Tasmania were sufficient to manage the response.

Biosecurity Tasmania has a range of trained and experienced staff capable of being redeployed to biosecurity incident response duties. Biosecurity Operations Branch has over 60 biosecurity inspectors for on-ground incident response duties. There are also approximately 10 highly skilled staff in each of the animal biosecurity and plant biosecurity branches. These staff are trained in specialist disciplines such as veterinary science and plant health diagnostics.

Incident response also requires staff with specialist operations knowledge and an understanding of emergency response procedures. A number of Biosecurity Tasmania staff have supported interstate incident responses over the years and are familiar with procedures implemented at a State as well as national level. A range of other staff and resources from the Invasive Species Branch and the Animal Health Laboratories in Biosecurity Tasmania would also be available to add to the Division's incident response capacity.

Interoperability Arrangements

The Tasmanian Government's Interoperability Arrangements are formal arrangements that allow the deployment of skilled employees from one agency to another to assist with the management or coordination of an emergency event. There are approximately 65 DPIPWE staff from across the agency on the interoperability list with a range of skills that match the very broad range of functions and responsibilities the agency has (eg. mapping specialists, coordinators, controllers, managers, specialist scientists, inspectors, field staff etc). During the blueberry rust outbreaks these staff were deployed internally during the response and would be available again for future incidents. In the event of a Level 3 or higher biosecurity response, the Interoperability Arrangements would enable a whole-of-government response where skilled employees from other agencies could be brought in to assist. Interstate support may also be available in higher level incidents under national agreements.

5. Any other matters incidental thereto

Community Awareness of Incident Response Process

As a specialist activity, response to biosecurity incidents, how it proceeds and particularly the decision-making process is not always well understood by some stakeholders including the general community and industry. Biosecurity response is a formal and structured process and uses the AIIMS model and the approaches are much the same as any emergency. These processes are implemented by trained professionals with knowledge of emergency response.

In plant biosecurity emergency responses, decision-making and forward planning are based on the best available information at the time to meet a pre-defined objective, for example: eradication or containment. This objective can change depending on a developing situation and the information available. A number of tools and expertise are used in response. An important planning tool is the “Appreciation” of the situation. This is developed by the response planners and considers all known factors and what that means for achieving the objective. The approaches used by Biosecurity Tasmania are nationally consistent.

Decision-making in relation to eradication can often be seen as contentious in responses. Decisions that take place at both technical and organisational levels are evidence based. The final decision made takes account of technical feasibility of eradication based on biological and other characteristics of the pest/disease and circumstance of the incursion, logistic possibilities, social factors, economics, and prioritisation with respect to other activities. It should also be noted that eradication success cannot be guaranteed when undertaking a response (a common misconception) and that plant biosecurity responses can have a generally low rate of success due primarily to biological characteristics of the pest or disease. Rust fungi for example are considered to have a very low likelihood of success even under the best circumstances due in part to their ease of transmission, the large spore loads they can generate, the risk of re-infection and the survivability of spores under certain conditions.

Resourcing

National response to exotic pests and diseases is run under the arrangements of the Emergency Plant Pest Response Deed (EPPRD). Conditions of the deed cover cost-sharing to fund what can be very resource-intensive operations across government and industry.

Biosecurity Tasmania uses the same systems and procedures in a State response as is used nationally, cost-sharing is not available in a single state response situation and the Tasmanian Government manages all operating costs in relation to responses.

Lessons Learnt

As with every response, Biosecurity Tasmania undertakes a process of evaluation to learn and improve its activities through a process of continual improvement. A number of lessons have been learned from the blueberry rust responses including:

- The need for a property register. A number of blueberry growing enterprises were unknown to both Biosecurity Tasmania and the industry peak bodies. Despite extensive communications and searching, a number of these properties only came to light in the early stages of the 2016 response. The TFGA, as part of their On-Farm Biosecurity Program, will develop a database that will detail the enterprises that farmers are growing and raising on their farm. This will be across all the agricultural industry sectors and will go some way to address this issue. At the national level the National Biosecurity

Committee has also been considering options for addressing the issue more broadly for the plant based industries.

- Processes for compensation of producers for impacts of the emergency response were not available to Biosecurity Tasmania. The Biosecurity Bill under development has been designed to rectify this situation.
- Communications processes require improvement. Despite extensive communications in both responses, gaps were still identified in both systems and performance (eg. approvals processes for external communications and website updates sometimes resulted in slow and incomplete communications occurring). Ongoing work is aimed at rectifying this.

Appendix 1 – Overview of Collection of Plant Samples for Diagnosis

Appendix 2 – Blueberry Rust Fact Sheet

Appendix 3 – 2014 Infected Premises List

Appendix 4 – Macquarie Franklin Report

Appendix 5 – Advice from Dr Bernadine Strik

Appendix 6 – Advice from Tasmanian Institute of Agriculture (2016)

Appendix 7 – Advice from Tasmanian Institute of Agriculture (2017)

Appendix 8 – Advice from the NSW Department of Primary Industries
2017

Appendix 9 – Site Management Plan for Blueberry Growers with
Blueberry Rust