



Australian Government

INTERIM INSPECTOR-GENERAL OF BIOSECURITY

Effectiveness of biosecurity controls for imported fresh cut flowers

Interim Inspector-General of Biosecurity

Audit report

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Summary

Introduction and background

1. The Australian Government's biosecurity system aims to minimise the risk of entry and establishment of exotic pests, weeds and diseases that could cause significant harm to the Australian economy and the environment.
 2. The Australian Government Department of Agriculture (the department) has primary responsibility for managing quarantine risks across the whole biosecurity continuum (pre-border, border and post-border). The Australian Government has regulatory responsibility for pre-border and border activities, while state and territory governments are primarily responsible for post-border activities such as surveillance and response to an incursion.
 3. In recent years, the department's biosecurity management has placed increasing emphasis on using pre-border (offshore) measures to address risks. Consistent with international agreements, a longstanding approach to mitigating quarantine risk offshore is to ensure documentation such as phytosanitary certificates accompany imported consignments, certifying that appropriate treatments have been carried out or that the goods are free from contamination, pests or diseases.
 4. The Interim Inspector-General of Biosecurity (IIGB), as part of his audit work plan, examined the effectiveness of the department's biosecurity controls for importing fresh cut flowers (including fresh foliage) into Australia. While this review identified some areas of possible improvement that should be addressed, the IIGB considers that overall, the department is managing relevant biosecurity risks in an appropriate manner.
 5. Ensuring the safe importation of material which poses a biosecurity risk is a primary goal of the department. The department's role in risk management and regulation applies across all import pathways – passengers, mail, air and sea cargo. Biosecurity risks are managed offshore, at the border, and within Australia—the biosecurity continuum—at the point where intervention is most effective.
- Offshore biosecurity activities are an important component of Australia's biosecurity system by reducing the biosecurity risk associated with imported goods and keeping the risks offshore. This is achieved by understanding global risks through intelligence and surveillance, working with international trading partners in multilateral forums, conducting risk assessments and developing biosecurity import conditions, and undertaking audit and verification activities.
 - Border activities aim to verify that imports meet the required biosecurity conditions and to intercept biosecurity threats that may be associated with imported live animals and plants, cargo, mail and incoming passengers, to reduce the likelihood of harmful pests and disease entering the country. This includes working with importers to achieve compliance, inspection of goods and baggage by biosecurity officers, utilising detector dogs and x-rays. In addition, the management of high-risk imported live animals, production genetics and

new plant varieties in post entry quarantine facilities, offers significant potential to increase Australia's productivity and competitiveness in those industries.

6. Within Australia, activities are undertaken in partnership with state and territory governments, industry and the community, to reduce the likelihood that a pest or disease establishes and minimise their potential impact, through early detection activities such as surveillance and diagnosis, and a capability to prepare for, and respond to, an incursion. It also includes the management of established pests and diseases.

7. To mitigate potential biosecurity risks of imported cut flowers, a systems-based management approach is applied, with a number of critical control points and processes along the import continuum, including:

- Limiting importation to certain species
- Limiting importation of cut flowers from approved countries
- Enabling offshore treatment for some pathways
- Requiring government inspection and certification of treatments prior to export
- Requiring verification of consignment containment on arrival, prior to movement to an inspection premises
- Requiring a 600-unit sample inspection of all consignments to verify freedom from significant pests and suitability of packaging
- Requiring mandatory fumigation of consignments, regardless of whether quarantine pests have been detected at inspection, unless a compliance-based fumigation exemption is in place
- Depending on species and country of export, additional measures are applied. This includes devitalisation treatments and/or additional re-inspection and further fumigation to confirm morbidity of pests with a known higher tolerance to methyl bromide, such as snails, if these are identified at inspection
- All intervention activities are covered by various policy documents, guidelines and work instructions to enable staff to make informed risk management decisions.

8. In 2012 Australia imported approximately 120 million units¹ of cut flowers and foliage. The quantity of imports has increased steadily in the past 20 years; however, it is difficult to precisely quantify the proportion of imported cut flowers sold in Australia. The major imported species and exporting countries are roses from Kenya, India, Colombia and Ecuador; orchids

¹ 'Unit' generally refers to the number of flower stems. However, the relevant tariff codes also include items such as grass, moss and lichen imported in bouquets or used for ornamental purposes.

from Singapore and Thailand; chrysanthemums from Malaysia and South Africa; and carnations from China and Vietnam.

9. An import permit is not required to import fresh cut flowers. However, imports of permitted cut flowers and foliage must comply with import conditions listed on the department's import conditions (ICON) database.

10. The department implements measures to minimise biosecurity risks under the *Quarantine Act 1908* and subordinate legislation, including the *Quarantine Proclamation 1998*. The Quarantine Act governs importation of cut flowers into Australia.

11. Before permitting any import, the department assesses biosecurity risks of any species of flowers that are not listed on its ICON database. The department undertakes a pest risk analysis, which assesses specific biosecurity risks and identifies appropriate risk management measures to be applied in meeting Australia's appropriate level of protection (ALOP). In 2013 the department released a final policy review: *Alternative risk management measures to import Liliium spp cut flowers from Taiwan*. The review considered the risks associated with importing *Lilium* spp cut flower stems without bulbils from Taiwan. (Department of Agriculture 2013).

12. The department has identified several plant diseases and insect pests of significant concern associated with imported fresh cut flowers. These include rose rust, powdery mildew of roses, powdery mildew of *Gypsophila* (*Oidium* spp.), leaf mining flies (*Lyriomyza* spp.), sudden oak death and botrytis diseases of *Allium* spp.

13. The department manages biosecurity risks associated with entry of imported cut flowers by:

- undertaking science-based pest risk analyses to underpin import policy (for example, importation of *Lilium* spp. cut flowers from Taiwan)
- imposing pre-border and border controls for importation of cut flowers (inspection on arrival, including inspection of consignment packaging to ensure that this meets the department's requirements)
- conducting on-arrival treatment of all commercial consignments of cut flowers (fumigation on arrival, unless the importer has a fumigation exemption) and devitalisation of propagatable flowers
- maintaining international collaborative networks and bilateral relationships
- gathering intelligence.

14. The department has also developed work instructions, guidelines and policy documents for imported cut flowers. These help identify sources of biosecurity risk and describe appropriate management measures (see points 1.13 to 1.17 and 1.42).

Purpose

15. This audit aims to inform the Australian Government Minister for Agriculture about the effectiveness of the department's biosecurity controls in managing risks associated with importing fresh cut flowers into Australia.

Key findings

Dependence on National Plant Protection Organisations

16. The department relies on the integrity and effectiveness of controls exercised by the National Plant Protection Organisation (NPPO) of an exporting country in ensuring consignments of fresh cut flowers are compliant with Australian import requirements. Certification of consignments by the NPPO is required for cut flowers that are treated offshore and/or produced under an overseas accreditation scheme. The department undertakes verification inspections on arrival, to check that offshore treatments are effective. The NPPOs in Singapore and Malaysia accredit export facilities and issue phytosanitary certification for devitalised flowers, stating that Australia's import requirements have been met. Similarly, the China Inspection and Quarantine agency accredits fumigation treatments of cut flower consignments before export to Australia. Between 2002 and 2012 department staff undertook in-country verification visits to Singapore and Malaysia to inspect phytosanitary systems at farms and packing houses in these countries.

Import requirements

17. An import permit is not required to import fresh cut flowers into Australia. Australia's import conditions and requirements for cut flowers are listed on the import conditions (ICON) database. The exporting country manages its export processes in accordance with its own export standards and procedures and its international inspection and certification obligations under the International Plant Protection Convention and relevant International Standards for Phytosanitary Measures (ISPM). A country's export systems and procedures also should ensure that cut flowers requiring phytosanitary certification that are exported to Australia comply with our import requirements. Document verification and physical inspection of fresh cut flower consignments on arrival are intended to ensure that consignments comply with Australia's import requirements.

Non-compliant packaging

18. One of the import requirements listed on the department's ICON database states that all consignments must be integrally packaged at the time of arrival. During fieldwork at cargo terminal operator (CTO) premises, the IIGB noted that some cartons stacked uncovered on pallets either had open holes or flowers packed in poor quality cartons that could collapse as moisture built up inside the cartons (due to plants' respiration). Such non-integral packaging could allow insect pests and other animals of quarantine concern to escape into the environment after the aircraft cargo doors were opened.

Integrity of department seals

19. After arrival at an Australian port, consignments are verified at CTO premises and permitted to move under department seal. The department issues a direction for movement, which authorises the importer to transport a consignment from an airline bond store to a designated quarantine approved premises (QAP) for inspection. A department seal is intended to ensure that the consignment remains under quarantine control until it is cleared and

released. In one of the regions, the department uses adhesive paper seals that are not waterproof and are easy to remove and replace without leaving any evidence of tampering. The IIGB considers that the use of such adhesive paper seals poses a potential biosecurity risk, given their questionable effectiveness.

Release of consignments for fumigation

20. In most regions, vehicles used for transport of consignments that are ordered for fumigation at a QAP (third-party premises) are permitted to travel to the QAP without a department seal. Further, the time taken in transit is not tracked or traced. This is a potential weakness in current controls.

Fumigation treatments

21. In 1996 the department implemented mandatory on-arrival methyl bromide fumigation to address frequent detections of live quarantinable pests in imported cut flowers. Between 1996 and 2013 the department introduced several schemes exempting cut flower consignments from approved countries from fumigation on arrival in Australia. However, these schemes required manual management of paperwork, were difficult for the department to manage, and were also challenging for industry.

22. In 2013 several of these schemes were amalgamated into an exemption scheme based on the fumigation exemption 'dashboard' (interfaced with the AIMS database), as part of a fumigation exemption policy that rewards industry for good compliance history. Several suppliers based in Singapore and Malaysia are accredited or registered by the NPPOs in these countries because they have systems in place to produce cut flowers with nil or low insect infestation; these suppliers are exempt from on-arrival fumigation requirements unless live insects are detected at inspection. The NPPOs in these countries issue and endorse accompanying phytosanitary certificates stating that the produce has been sourced from an accredited supplier; included is a declaration that additional treatment requirements for certain species have been met.

23. For fumigation exemption for non-accredited suppliers from all countries, consignments must be accompanied by phytosanitary certification, and at least five previous consecutive consignments from the same supplier must have been pest-free for the sixth (and all consecutive consignments) to be released without mandatory fumigation. This is provided that no pests are found during the mandatory on-arrival inspection.

Efficacy checks after fumigation

24. Fumigation requirements are specified in the Australian Fumigation Accreditation Scheme methyl bromide fumigation standard, which approved treatment providers must comply with. Imported cut flowers come with a considerable amount of packaging material such as cardboard, plastic and cellophane. These materials can impede gas circulation during fumigation, and it is important to ensure that the treatment with methyl bromide has been effective in killing all live insects and other pests. However, the IIGB noted that following fumigation treatment, the department releases consignments without re-inspecting them

(unless snails or slugs are detected). This is a potential weakness in the department's control systems, given the significant number of intercepted consignments that contain live pests. During fieldwork, department staff in the South East and Central East regions confirmed that live insects were sometimes found after the on-arrival fumigation treatment (during re-inspection for snails or slugs). In addition, the IIGB was informed that the Department of Agriculture and Food Western Australia sometimes detects live pests in flower consignments previously cleared by the department in other states.

25. The department's Compliance Arrangements Branch regularly audits all approved, third-party QAPs; however, the focus is more on compliance with agreed system protocols. Each region has recorded instances where fumigation treatment provided by a third party was ineffective, with live insects sometimes found after two fumigation treatments. The need for regular or random post-fumigation efficacy checks should be considered, to establish the effectiveness of fumigation treatments. The department should consider this additional requirement, in the context of its risk-return policy, taking account of the biosecurity risks and the additional costs to industry.

Devitalisation requirements and testing

26. Devitalisation renders live plant material non-viable by using a chemical (glyphosate, a wide-spectrum herbicide) to inhibit or prevent propagation of material such as roses. The IIGB understands that the devitalisation requirement assists in reducing the risk of transmission and spread of plant pathogens of biosecurity concern. The department accepts devitalised consignments of propagatable cut flower species from 18 countries listed on the ICON database. The NPPO in each of these countries monitors treatment providers and confirms on accompanying phytosanitary certificates that the required devitalisation treatment has been performed correctly. Glyphosate dosage and dipping requirements are also included on the phytosanitary certificate.

27. The IIGB noted that the department is presently investigating the possibility of either removing the requirement for devitalisation based on a risk assessment, or finding improved ways to test imported cut flower consignments for effective devitalisation. The IIGB understands that Australia is the only country with this requirement, and its necessity is being queried by some sectors of industry.

28. To check that offshore devitalisation is being correctly performed, inspectors select five random samples of stems every month, representing a supplier–importer combination. The results of these propagation tests are used to provide general verification of the efficacy of devitalisation procedures, not to clear individual consignments.

29. In the South West region (Perth), the IIGB inspected the propagation facility (glasshouse, operated by a third party) used for testing of sampled cuttings; this facility did not provide an optimal environment for propagation, such as humidity control or a misting unit with a heat bed. If the department intends to retain the requirement for devitalisation, it should ensure that propagation facilities across the regions meet minimum requirements for providing optimal conditions for sampled plant material to propagate.

30. The IIGB noted the need for some improvement in the way sampled plant material was packaged and transported to a facility for propagation testing, in one region. The department should ensure that the sampled material is wrapped in a moist paper towel, packaged in a cool insulated box and delivered as soon as possible to the propagation facility.

Industry consultation

31. The IIGB undertook fieldwork in three regions: Central East (Sydney), South East (Melbourne) and South West (Perth). He consulted major importers, customs brokers and/or Class 2.4 QAP operators providing fumigation treatment in each region. He also consulted staff from the Department of Food and Agriculture in Perth because Western Australia has specific inspection and fumigation requirements for imported fresh cut flowers consignments; they confirmed that live arthropods were occasionally detected in such consignments. Industry suggested the department accept a duplicate copy of a phytosanitary certificate when the original document is misplaced or delayed in transit. It was noted that, to address this issue, the department is considering a review of document requirements for imported cut flower consignments.

Information technology performance

32. In managing entry through to clearance of imported consignments of cut flowers, the department relies on integrated and networked information technology systems across all regions. Entry management and inspection staff use the department's Australian Import Management System (AIMS) database daily to record real-time processes, including entry management, point-to-point movement of imported goods and inspection findings. AIMS interfaces with the Customs' Integrated Cargo System (ICS). Staff in the South West Region commented that ICT system outages sometimes make it difficult to clear goods in a timely fashion. This is also frustrating for importers as department staff cannot make decisions about consignments until AIMS and ICS are restored. In such circumstances, importers typically opt for mandatory fumigation of cut flowers because further delays could result in commercial losses.

Staff non-compliance with standard operating procedures or work instructions

33. For entry management, the department's online ICON database stipulates that staff undertaking CTO verification at the first port of entry must verify the integrity of each consignment before it is moved to a QAP for inspection and ensure that the consignment is sealed and secured before being moved. However, department staff in one region did not appear to consider requirements for integral packaging before arrival at a CTO, nor did they seal/secure consignments that arrived in cartons stacked on pallets and held at the CTO for an extended period (during which, cross-contamination between different consignments could potentially occur). The IIGB observed that many cartons had open ventilation holes, and were cleared through CTO verification. The ICON case clearly states that cut flower consignments arriving in Australia must be transported in sealed containers.

34. The IIGB also noted that during inspection of one imported consignment in the South East Region, staff did not conform to work instructions that clearly stipulate examination of 90 per cent of flowers from the representative sample under a magnifying lamp for signs of

infection or infestation. Staff undertaking inspections should ensure that correct procedures are followed, so that biosecurity risks are detected and dealt with satisfactorily.

In-country assessment of an exporting country (Kenya)

35. In 2012–13 Australia imported approximately 120 million units of cut flowers and foliage; representing a significant percentage of total purchases of cut flowers. Based on discussions with industry, it appears that the proportion of imports is likely to increase.

36. Aside from the economic impact on local flower production, cut flower imports also raise concerns about biosecurity risks. The costs to both government and industry of addressing these risks are considerable. In a challenging business climate, there might be an increased temptation to cut costs by paying less attention to biosecurity risks. Cut flowers are imported from 25 countries, including three (Singapore, Malaysia and China) that have approved pathways with simplified clearance procedures. Because Kenya is exporting increasing volumes of flowers, particularly roses, and live insect detections are relatively frequent in Kenyan consignments, the IIGB decided to undertake an in-country assessment that focused on biosecurity risks to Australia.

37. The IIGB visited five flower farms in two regions of Kenya, met with management and officers of the country's NPPO, Kenya Plant Health Inspectorate Service (KEPHIS), and observed pre-export inspections performed by KEPHIS staff. Kenya supplies more than one-third of the European cut flower market and consignments are regularly audited by independent (European) standards agencies, together with some larger supermarket chains. The IIGB observed that while some aspects of the pre-export inspection process could be improved, on-farm management was generally of a high standard, on the farms visited. It seems possible that some insects detected in Kenyan consignments on arrival in Australia, might be beneficial predators used in integrated pest management programs in Kenya.

Conclusion

38. Demand for fresh cut flowers is increasing steadily in Australia, with imports peaking before Valentine's Day and Mother's Day each year. In 2012 more than 120 million units of cut flowers and foliage were imported into Australia. Imports of various species of cut flowers are likely to increase, due to significantly lower production costs compared with those in Australia and continuing consumer demand for varied and new varieties throughout the year.

39. Fresh cut flowers are perishable commodities that can rapidly lose quality and vase life. Importers aim to get the imported produce into the market as quickly as possible. While recognising this commercial imperative, the department strives to ensure biosecurity risks associated with imports meet Australia's ALOP before consignments are released from quarantine control. While this review identified some areas of possible improvement that should be addressed, it was considered that the department generally is managing relevant biosecurity risks in an appropriate manner.

40. The department recognises that imported fresh cut flowers pose a biosecurity risk, due partly to the wide range of exotic pests and diseases that imported consignments can carry. Consequently, setting specific import requirements based on scientific risk assessment is necessary to manage the risks and safeguard Australia's biosecurity. A major failure in an import control system could pose a considerable biosecurity threat to Australia.

41. The IIGB was informed that devitalisation of propagatable species is necessary to reduce the likelihood of transmission of plant pathogens. To address risks from such pathogens and eliminate the possibility of post-import propagation, the department uses a systems-based management approach to mitigate potential quarantine risks. This includes restricting imports to certain species, limiting imports from approved countries, enabling treatment offshore for some pathways, requiring government inspection and certification of treatments prior to export, requiring verification of consignment containment on arrival prior to movement to an inspection premises, on-arrival inspection of all consignments, devitalisation of propagatable species, etc. The department also manages risks by undertaking a risk assessment for each cut flower species and the relevant offshore controls. All imported cut flower consignments are subject to fumigation treatment on arrival, unless they are on an approved exempt pathway and no live insects were detected during inspection. The department should consider instituting regular or random testing for efficacy of on-arrival fumigation, in addition to the current testing regime for devitalisation treatments. It is acknowledged that this would require changes to current controls, and impose some additional costs.

42. Based on limited exposure to a cross-section of flower producers and discussions with relevant government and industry representatives in Kenya, the IIGB believes that the department is effectively addressing biosecurity risks associated with flower imports from Kenya. It seems possible that closer liaison of Kenyan authorities and industry with the department could result in present regulatory requirements being modified; for example, to include identification and recognition of biological control agents in imported consignments. It

would be necessary for the department to undertake a risk assessment of such biological agents, to ensure they were not quarantine pests.

43. The management of increasingly high volumes of cut flower imports, especially prior to Valentine's Day and Mother's Day, can be a complex and challenging task. In an ever-more demanding business environment, the department is investigating and implementing various improvements in its management of biosecurity risks. The further strengthening of partnerships with industry can greatly assist and expedite these improvements. This report has identified several areas of possible improvement in the department's controls for imported fresh cut flowers. The recommendations made in this report aim to strengthen these controls.

Recommendations

The full department response to the recommendations is at Appendix A.

Recommendation 1

paragraph 4.17	<p>The department should enforce current requirements for integral packaging of all imported cut flower consignments and give industry advance notice (six to nine months) of its intention to do so. Alternatively, the risks associated with non-integral packaging should be reviewed.</p> <p>Department's response: Agree.</p>
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Recommendation 2

paragraph 4.22	<p>The department should review the necessity for seals on trucks, applied to provide security for consignments being transported between cargo terminal operators, quarantine approved premises and approved fumigation facilities. If their use is continued, the type of seal should be effective and consistent across regions.</p> <p>Department's response: Agree.</p>
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Recommendation 3

paragraph 4.28	<p>The department should consider the need for regular or random post-fumigation checks for live pests, in the context of its risk-return policy, taking account of the biosecurity risks and the additional regulatory burden on industry.</p> <p>Department's response: Agree.</p>
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Recommendation 4

paragraph 4.32	<p>The department should consider reducing its dependence on methyl bromide gas for treatment of pests in imported cut flower consignments, and consider the assessment and approval of alternative treatments.</p> <p>Department's response: Agree.</p>
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Recommendation 5

paragraph 4.38	<p>The department should undertake a review of the existing devitalisation policy and its implementation, and this should occur within the next 18 months.</p> <p>Department's response: Agree.</p>
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Recommendation 6

paragraph 4.47	<p>To ensure that devitalisation test results are reliable, the department should ensure that propagation facilities provide optimal conditions for sampled plant material to propagate; optimal conditions should also be maintained during transport of samples.</p> <p>Department's response: Agree.</p>
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[signed]

Dr Michael Bond
Interim Inspector-General of Biosecurity
13 January 2015

Acknowledgements

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- Industry organisations, companies and individuals, in Australia and Kenya
- Australian Government Department of Agriculture staff
- Officers of the Kenya Plant Health Inspectorate Service.

Their assistance is gratefully acknowledged.

1. Background

Biosecurity risks

1.1 Importation of plants and plant parts, including cut flowers, poses a biosecurity risk to Australia's plant industries, environment and economy. The pathways for entry of plant material are:

- fresh cut flowers and foliage—the focus of this audit
- nursery propagation stock; imported plant material is grown and propagated under quarantine and is subject to stringent disease testing for two years.

1.2 Importation of plant material with flowering and/or vegetative parts present several biosecurity risks as they may be:

- contaminated with soil, insects, snails, diseases or other quarantine risk material
- propagatable (with a possibility of becoming invasive species or weeds)
- carrying viable berries and fruits.

1.3 Many flowers have adapted/developed for the primary purpose of attracting insects. Therefore there is a risk that fresh cut flowers may be harbouring insect pests. They may also carry mites, nematodes, molluscs, bacteria, fungi, viruses, other parasitic plants or their reproductive parts that could cause disease or damage in plants. Appendix B lists plant diseases and insect pests of imported cut flowers that are of biosecurity concern.

1.4 Outbreaks of exotic plant diseases are not commonly detected in Australia; when they do occur they can be disruptive and costly. For example, in April 2010 the myrtle rust (*Puccinia psidii* sensu lato) fungus was detected in commercial nursery properties on the central coast of New South Wales. This disease has spread across New South Wales, Queensland and Victoria, infecting commercial plant nurseries, public amenities and large areas of bushland, with substantial ongoing economic and environmental costs to the Australian community (Carnegie & Lidbetter 2012).

1.5 Similarly, the papaya fruit fly outbreak near Cairns in 1995 incurred an estimated response cost of around \$34 million, disrupted the marketing of nearly all fruit crops from North Queensland and cost growers up to \$100 million (ANAO 2001).

1.6 Ensuring the safe importation of material which poses a biosecurity risk is a primary goal of the department. The department's role in risk management and regulation applies across all import pathways – passengers, mail, air and sea cargo. Biosecurity risks are managed offshore, at the border, and within Australia—the biosecurity continuum—at the point where intervention is most effective.

- Offshore biosecurity activities are an important component of Australia's biosecurity system by reducing the biosecurity risk associated with imported goods and keeping the risks offshore. This is achieved by understanding global risks through intelligence and surveillance, working with international trading partners in multilateral forums, conducting

risk assessments and developing biosecurity conditions, and undertaking audit and verification activities.

1.7 Border activities aim to verify that imports meet the required biosecurity conditions and to intercept biosecurity threats that may be associated with imported live animals and plants, cargo, mail and incoming passengers, to reduce the likelihood of harmful pests and disease entering the country. This includes working with importers to achieve compliance, inspection of goods and baggage by biosecurity officers, utilising detector dogs and x-rays. In addition, the management of high-risk imported live animals, production genetics and new plant varieties in post entry quarantine facilities, offers significant potential to increase Australia's productivity and competitiveness in those industries.

1.8 Within Australia, activities are undertaken in partnership with state and territory governments, industry and the community, to reduce the likelihood that a pest or disease establishes and minimise their potential impact, through early detection activities such as surveillance and diagnosis, and a capability to prepare for, and respond to, an incursion. It also includes the management of established pests and diseases.

1.9 To mitigate potential biosecurity risks of imported cut flowers, a systems-based management approach is applied, with a number of critical control points and processes along the import continuum, including:

- Limiting importation to certain species
- Limiting importation of cut flowers from approved countries
- Enabling offshore treatment for some pathways
- Requiring government inspection and certification of treatments prior to export
- Requiring verification of consignment containment on arrival, prior to movement to an inspection premises
- Requiring a 600-unit sample inspection of all consignments to verify freedom from significant pests and suitability of packaging
- Requiring mandatory fumigation of consignments, regardless of whether quarantine pests have been detected at inspection, unless a compliance-based fumigation exemption is in place
- Depending on species and country of export, additional measures are applied. This includes devitalisation treatments and/or additional re-inspection and further fumigation to confirm morbidity of pests with a known higher tolerance to methyl bromide, such as snails, if these are identified at inspection
- All intervention activities are covered by various policy documents, guidelines and work instructions to enable staff to make informed risk management decisions.

Australian entry ports

1.10 The Central East (Sydney), South West (Perth) and South East (Melbourne) regions are the major ports of entry for fresh cut flowers in Australia (Map 1). Much smaller quantities are received at Northern (Cairns, Darwin and Indian Ocean Territories) and North East (Brisbane, Gladstone, Mackay and Townsville) ports.

Pest risk analysis

1.11 A pest risk analysis identifies, assesses and classifies biosecurity risks associated with the commodity proposed for import. The analysis is conducted within a consultative framework and recommends risk management measures for meeting Australia's ALOP for the proposed import, as outlined in the *Import risk analysis handbook 2011* (DAFF 2011a).

1.12 To date, the only pest risk analysis published by the department, covers *Lilium* spp. cut flowers from Taiwan. For other permitted cut flower species, the department has undertaken generic risk assessments.

Biosecurity policies

Exemption from mandatory on-arrival fumigation of *Lilium* spp. cut flowers from Taiwan

1.13 Following the Taiwanese Government's request in 2012 for exemption from on-arrival mandatory methyl bromide fumigation of *Lilium* spp., the department assessed the quarantine risks associated with the importation of *Lilium* spp. cut flowers from Taiwan.

1.14 The review of policy (Department of Agriculture 2013) to import *Lilium* spp. cut flowers from Taiwan:

- identified a number of pests of quarantine concern, including several species of beetles (arthropod pests), thrips, leaf miners and moths, as well as several viruses
- proposed measures to manage the phytosanitary risks.

1.15 The department considers that the risk management measures proposed in this policy, including a systems approach administered by Bureau of Animal and Plant Health Inspection and Quarantine (Taiwan) and phytosanitary inspection, will adequately mitigate the identified biosecurity risks.

1.16 Consistent with the existing policy for imported fresh cut flowers, the identified viruses are managed through the requirement that stems be free from bulbils, minimising the risk of intentional propagation of the cut flowers. This minimises the risk of viruses and other pests entering through this importation pathway or becoming established in Australia.

1.17 At the port of entry in Australia, the department examines accompanying documents for consignment verification purposes, before the imported *Lilium* spp. cut flowers are inspected and discharged. On arrival, department staff inspect all *Lilium* spp. cut flowers. Detection of live insects, disease symptoms or regulated articles will result in failure of the consignment. Remedial actions for failed consignments include methyl bromide fumigation if live insects are detected, and export or destruction if stem bulbils are detected, as required.

Cargo terminal operator verification for airfreight perishable commodities

1.18 Moving infested perishable commodities (Appendix C) between locations after arrival poses a potential biosecurity risk of actionable (quarantine) pests escaping into the environment. Verifying the integrity of imported consignments helps maintain a biosecure pathway for products entering Australia.

1.19 The national policy for verification of imported perishable goods at the cargo terminal operator (CTO) (internal document, DAFF 2012c) identifies imported cut flowers as a high risk commodity that requires mandatory verification prior to movement to the inspection point. CTO verification involves department officer visually checking each imported cut flower consignment to ensure that it is suitably contained for movement to an inspection point. All consignments that are secured on arrival may, at the department's direction, be moved to a nominated inspection point.

1.20 Consignments that arrive unsecured must be secured before being moved from the CTO. Consignments must be secured by shrink-wrapping, covering with plastic sheeting and loaded into an enclosed vehicle or any other means that will restrict the escape of insect pests.

International standards and codes for preventing dissemination of plant pests and diseases

1.21 Australia is fortunate in being relatively free of many of the serious animal and plant pests and diseases that exist in other countries. This gives Australia's export-oriented agricultural industries an advantage in global markets. It is also important for maintaining the unique characteristics of Australia's natural environment. Managing threats to industry and the environment is an essential function of the quarantine and biosecurity system.

1.22 Specific International Standards for Phytosanitary Measures have not been developed for fresh cut flowers. However, the International Plant Protection Convention (IPPC) recently called for the nomination of experts to develop international standards on International movement of cut flowers and branches (FAO 2013). World Trade Organization agreements are the legal foundation for the international trading system. The main agreements related to technical conditions for trade in agricultural products are the Agreement on Technical Barriers to Trade and the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS agreement).

1.23 The SPS agreement sets out the rules for plant health standards (phytosanitary measures) that may, directly or indirectly, affect international trade. It allows countries to set their own standards provided they are science-based. SPS measures should be applied only to the extent necessary to protect human, animal or plant life or health. They should not arbitrarily or unjustifiably discriminate between countries where identical or similar conditions prevail.

1.24 Australia aims to conduct quarantine risk analysis in accordance with the International Standards for Phytosanitary Measures (ISPM), including:

- ISPM 2 *Framework for pest risk analysis* (FAO 2007)
- ISPM 11 *Pest risk analysis for quarantine pests, including analysis of environmental risks and living modified organisms* (FAO 2004)
- ISPM 12 *Guidelines for phytosanitary certificates* (FAO 2005).

1.25 Certification of cut flower consignments should be in accordance with *ISPM 12 Guidelines for phytosanitary certificates* to provide formal documentation to the department verifying that relevant measures have been undertaken offshore for fresh cut flowers before export to Australia (FAO 2006).

1.26 The pest risk analysis process is a technical tool used for identifying appropriate phytosanitary measures. The analysis process may be used for organisms not previously recognised as pests (such as plants, biological control agents or other beneficial organisms and living modified organisms), recognised pests, pathways and review of phytosanitary policy (FAO 2007).

Appropriate level of protection

1.27 The SPS agreement defines the concept of an appropriate level of protection (ALOP). Like other countries, Australia's ALOP is expressed qualitatively as being a high level of sanitary and phytosanitary protection, aimed at reducing risk to a very low level but not to zero. Successive Australian governments have adopted this conservative approach to managing quarantine and biosecurity risks, reflecting community expectations about the importance of maintaining Australia's relative freedom from exotic pests and diseases.

1.28 Under this approach, commodities may not be imported unless quarantine and biosecurity risks can be reduced to a level consistent with Australia's ALOP. The Australian Government uses risk analyses to consider the level of quarantine and biosecurity risk associated with importation or proposed importation of plants and plant material. The process used is consistent with Australia's obligations under the SPS agreement. It takes into account relevant plant health standards developed by the International Plant Protection Convention's international standards on risk assessment.

1.29 If the Director of Animal and Plant Quarantine finds that the risks associated with importing a commodity exceed the level of risk acceptable to Australia, appropriate risk management measures are proposed to reduce them to that level. If biosecurity risks cannot be reduced to an acceptable level, those imports are not permitted. The department's import decision framework is set out under the *Quarantine Act 1908*.

1.30 Australia exports approximately two-thirds of its agricultural production. Compliance with SPS rules and obligations allows Australia to expect similar compliance from its trading partners. This provides Australian exporters with significant benefits in accessing overseas markets.

Australian arrangements

1.31 Within the Australian Government, key plant biosecurity functions are located in the Department of Agriculture.

- The Secretary of the Department of Agriculture is appointed Director of Animal and Plant Quarantine under the *Quarantine Act 1908*. The director, or their delegate, is responsible for determining whether or not importation of a commodity of biosecurity concern can be permitted and, if so, under what conditions.

- The Plant Biosecurity Branch within the department undertakes risk analyses, develops recommendations on biosecurity policy and provides quarantine advice to the Director of Animal and Plant Quarantine and to the department's Plant Import Operations Branch.
- The Plant Import Operations Branch develops operational procedures, delivers quarantine services and makes quarantine decisions, including setting import requirements under delegation from the Director of Animal and Plant Quarantine.
- The department's Plant Health Policy Branch works with Australia's state and territory governments to coordinate pest and disease preparedness, emergency responses and intrastate quarantine and biosecurity arrangements.
- The department's Trade and Market Access Division works with industry and trading partners to develop new markets, maintain existing markets, reduce trade distortions, reduce plant and animal disease risks and develop international trade standards.

Biosecurity continuum

1.32 Australia's quarantine and biosecurity system is regarded as a continuum, from pre-border to border and post-border activities (Figure 1).

1.33 In the pre-border arena, Australia:

- participates in international standard-setting bodies
- undertakes risk analyses in relation to plants, animals and/or other goods proposed for import
- maintains, including through bilateral and multilateral cooperation, intelligence on the disease and pest status of its trading partners
- develops offshore biosecurity arrangements where appropriate
- works with its neighbours to build capacity to counter the spread of exotic pests and diseases.

1.34 At the border, Australia screens vessels (ships and aircraft), people and goods (such as cargo and mail) entering the country to detect any threats to human, animal and plant health and the environment. The Australian government also undertakes targeted post-border measures, including working with state and territory governments and industry to coordinate emergency responses to pest and disease incursions. State and territory authorities undertake inter and intrastate quarantine operations, reflecting regional differences in pest and disease status, as part of their plant protection responsibilities. Figure 1 shows the responsibilities and activities of various agencies across the quarantine and biosecurity continuum.

Risk-return approach to biosecurity management

1.35 As part of its business reform program (Beale et al. 2008), the department has been changing the current business model from one focused on mandatory 100 per cent intervention at the border to a 'risk-return' approach across the whole biosecurity continuum, that is

offshore, at the border and onshore (DAFF 2012a). A risk-based approach to biosecurity operations:

- allows the department's resources to be better utilised in containing the risks of the highest biosecurity concern while maintaining assurance on lower risk items and pathways
- reduces the overall intensity of intervention, based on good compliance resulting in reduced audit rates and inspections for imported commodities
- rewards compliant importers with a history of good performance and allows faster clearance at the border.

Legislation

1.36 Importation of cut flowers is governed by the *Quarantine Act 1908* and regulations. The Act provides for the Governor-General to prohibit, through the Quarantine Proclamation 1998, importation of goods into Australia that are likely to introduce disease or pests.

1.37 Appendix D lists legislation relevant to plant quarantine and examination of imported plants.

Import requirements

1.38 The department's import conditions (ICON) database provides information on import requirements for fresh cut flowers of specified plant genera (and species) as they relate to each country of export.

1.39 A permit is not required to import fresh cut flowers. Cut flowers of permitted species can be imported into Australia from all approved countries and are subject to specific import requirements and treatment (as applicable) on arrival.

1.40 When fumigation and/or devitalisation treatments are undertaken offshore, the consignment must be accompanied by completed phytosanitary and devitalisation certification. Schedule 6 of the Quarantine Proclamation 2008 (as amended) identifies plants that must not be imported into Australia.

1.41 Not every plant species can be imported into Australia as cut flowers and/or foliage. ICON lists the names of permitted cut flowers species that can be imported into Australia and the permitted source country. Most permitted plant species can be imported from any country; however, some species can only be sourced from certain approved countries. For example, flower heads/buds (loose or in garlands) of Arabian jasmine (*Jasminum sambac*) can only be imported from India, Malaysia and Singapore. Similarly, leaves of *Dracaena* spp. can be imported from Indonesia, Malaysia, Mauritius, Singapore and Thailand only.

Work instructions and guidelines

1.42 The department has prepared work instructions and guidelines to help department officers with verification inspection, treatment (when required) and clearance of fresh cut flower consignments:

- Instruction and guideline: movement protocol for live/viable quarantinable material for OSP analysis (internal document, DAFF 2013c)
- Instruction and guideline: Imported cut flower clearance (internal document, DAFF 2013b)
- Imported cut flower treatment guide (DAFF 2012b)
- Instruction and guideline: cut flower devitalisation and audit (internal document, DAFF 2012b)
- Work instruction: cut flowers and foliage inspections for non-commercial consignments and for personal consignments at Australian international airports (internal document, DAFF 2012d)
- Guideline: Guide to re-conditioning of fresh produce consignments including cut flowers and foliage (internal document, DAFF 2012a)
- Work Instruction: methyl bromide fumigations: supervision and monitoring (internal document, DAFF 2011)

1.43 Officers engaged in verification inspection, treatment and clearance of imported fresh cut flowers must also comply with the *Work Health and Safety Act 2011*.

Audit objective, scope and methodology

1.44 To examine how effectively the Department of Agriculture manages biosecurity risks associated with importing fresh cut flowers and foliage into Australia, particular emphasis was given to:

- import requirements—adequacy of import requirements in managing biosecurity risks
- certifications and declarations—adequacy of accompanying documentation in addressing biosecurity risks
- assessment of verification systems that the department has in place to ensure compliance with relevant import requirements
- pre-border activity—assurance activities in exporting establishments in a country (Kenya) engaged in
 - production and export of flowers and
 - providing department-approved devitalisation treatment(s) to cut flowers before export
- border activity
 - assessment of verification inspection procedures for imported cut flower consignments and
 - mandatory on-arrival treatment of imported consignments
- identification of any improvements required to import procedures, operations and/or documentation for cut flowers to mitigate any identified biosecurity risks.

1.45 The audit did not examine:

- the merits of department policy on imported cut flowers
- detection of illegally imported cut flowers, if any
- importation of live plant material other than cut flowers and foliage
- post-border surveillance activities undertaken by state or territory authorities.

Audit methodology

Case studies

Pre-border

1.46 In 2012 more than 120 million units of cut flowers and foliage were imported from approved countries into Australia (Table 1). Kenya is currently one of the largest exporters of fresh cut flowers to Australia. The IIGB visited Kenya to review the effectiveness of that country's phytosanitary services and to assess biosecurity controls for exporting fresh cut flowers to Australia.

1.47 In Kenya, the IIGB held meetings with:

(a) Growers of cut flowers (mainly roses) to discuss

- management of pests and diseases on farm
- production procedures and company policies
- quality control of production, including audit arrangements
- Australia's import requirements and clearance procedures
- certifications and declarations
- pre-export inspection requirements and procedures
- staff experience and training
- devitalisation treatments
- information management systems.
-

(b) Kenya Plant Health Inspectorate Service (KEPHIS)

- discussions with senior management about controls in place to meet Australia's import requirements for fresh cut flowers
- scope of KEPHIS responsibilities and those of related government agencies
- KEPHIS understanding of Australia's import requirements
- training of inspection staff
- relationships with industry and industry organisations

- KEPHIS facilities for identification of diseases and pests
- pre-export inspections at Jomo Kenyatta International Airport, Nairobi.

(c) Kenya Flower Council (KFC)

- briefing on KFC membership, history, scope of activities
- producer audit programme
- liaison with KEPHIS and other government agencies.

(d) Customs agents

- logistics involved in meeting requirements of flower industry
- liaison with KEPHIS, provision of inspection facilities.

Border

1.48 The IIGB undertook audit inspection visits to these high-volume import ports in three regions (Map 1):

- Central East Region (Sydney)
- South East Region (Melbourne)
- South West Region (Perth)

1.49 During fieldwork at regional offices, the IIGB met with:

(a) Department staff—assessment of border clearance and verification systems that the department has in place to ensure compliance with import requirements for imported fresh cut flowers. Discussions covered:

- import requirements and clearance procedures
- certifications and declarations
- CTO verification
- inspection requirements and procedures
- staff experience and training
- criteria and rate of sampling of flowers/foilage for inspection and propagability testing
- mandatory fumigation and/or devitalisation treatments
- electronic systems used in decision-making and recording data/information (for example, ICON, AIMS, ICS, fumigation exemption dashboard and MAPS)
- work instructions and standard operating procedures relevant to CTO verification and inspection procedures
- internal communication

- performance of third-party QAPs doing fumigation treatments
 - record check and sampling for (non)compliance.
- (b) Customs broker (importers' agents)—expectations, service delivery by the department and feedback.
- (c) Operators of Class 2.4 QAP—fumigation of imported fresh cut flower consignments.

The audit team

Auditors Dr Naveen Bhatia and Mr Ajay Singh assisted the IIGB to undertake this audit.

2. Pre-border controls

2.1 Many types of cut flowers and foliage can be exported to Australia. These may be infested with insects, infected with plant disease or propagated from stem cuttings. It is therefore essential that importers comply with requirements that limit biosecurity risks.

2.2 Propagatable flowers are species that can be grown from stem cuttings. Propagation may introduce plant diseases; therefore, the department requires importers to devitalise some types of flowers. Devitalisation is a mechanical or chemical process that prevents cut flowers from being re-grown from cuttings.

2.3 Import conditions for propagatable and non-propagatable flowers and foliage are outlined in ICON, the department's import conditions database.

Fumigation requirements

2.4 Department officers inspect all cut flower consignments entering Australia. Since 1996 the department has imposed mandatory on-arrival methyl bromide gas fumigation of all imported fresh cut flowers. An exception to this requirement is where an exporting country demonstrates and maintains compliance for freedom from quarantine pests (confirmed on the phytosanitary certificate that Australia's import requirements have been met) (Figure 2).

2.5 The department developed and tested various schemes for managing fumigation exemptions between 2003 and 2013, but these have now been discontinued. They were time consuming and resource intensive for the department to manage, especially the manual handling of paperwork; some exporters and importers also found them difficult to understand.

2.6 Typically, the required methyl bromide rate for fumigation of cut flowers is 32 g/m³ for two hours at 21 °C. Temperature and dosage compensation requirements apply as per the [AFAS methyl bromide fumigation standard](#) (Department of Agriculture 2014a). Fumigation should only commence when all cut flower boxes are exposed to at least 80 per cent of the initial gas concentration. Modified shipping containers are often used as fumigation chambers by third-party service providers (Figure 3), who are regularly audited by the department's Compliance Arrangements Branch across the regions.

Fumigation exemptions

2.7 The department has approved systems approaches to exempt some imports from fumigation, as described in 2.8 to 2.17.

Overseas accreditation schemes

2.8 Under overseas accreditation schemes, Australia has agreements in place with Singapore (2003 onward) and Malaysia (2004 onward). These schemes were established to exempt accredited cut flower suppliers in the country of origin from mandatory fumigation of imports on arrival in Australia.

2.9 Under these schemes, the exporting country has a systems approach monitored and certified by its National Plant Protection Organisation (NPPO) that ensures that flowers for export to Australia are free from quarantine pests.

2.10 All flower consignments that have an exemption are still inspected on-arrival by departmental officers. All imported consignments of fresh cut flowers exempt from mandatory fumigation on arrival must be accompanied by a valid phytosanitary certificate. If the certificate is not presented, the consignment is subjected to mandatory fumigation.

Supervised fumigations in China

2.11 Under this scheme, all cut flower fumigations in China are supervised and certified by the Chinese Government (China Inspection and Quarantine) and are exempt from mandatory treatment in Australia. The IIGB noted that cut flower consignments treated in China still require inspection in Australia and remedial treatment is applied if live pests are detected.

Importer-initiated pathways fumigation exemptions

2.12 Until 31 May 2013, importers of cut flowers could apply for an exemption based on a favourable compliance history for a supplier and specific type of flower. Under this exemption, the department considered applications from importers for exemptions from fumigation for the these specified pathways:

- importer
- permitted cut flower genus
- supplier/exporter or grower from a particular country of origin.

2.13 The department withdrew the importer-initiated pathway fumigation exemption in May 2013 and replaced it with a fumigation exemption 'dashboard' (in the AIMS database) for tracking compliance history of all importers and exporters (see 2.14 for details).

Management of fumigation exemptions

2.14 The department, as part of its business reform and implementation of Beale review recommendations (Beale et al. 2008), has been changing its business model from one focused on mandatory intervention at the border to a risk-return approach across the biosecurity continuum—that is, offshore, at the border and onshore (DAFF 2012a). The Beale review emphasised the need to manage risks offshore, as far as possible, through pre-border strategies.

2.15 In December 2012 the department issued a notice to industry (DAFF 2012d; Appendix E) about testing a simplified tracking system. The system used an electronic fumigation exemption 'dashboard' to manage fumigation exemptions in the Central East Region (Sydney). Launched in January 2013 and trialled for three months, the pilot system tracked individual import pathways and automatically applied rules (treat or release) based on inspection results and ongoing compliance history.

2.16 In April 2013 the department issued another notice to industry (DAFF 2013) advising importers of fresh cut flowers that the pilot system for cut flower fumigation exemptions would be extended Australia-wide from 1 June 2013. A copy of this notice to industry is at Appendix F.

2.17 Features of the fumigation exemption 'dashboard' (Figure 2) include:

- During the pilot, importer and supplier pathways that demonstrated compliance (freedom from live quarantine pests) in five consecutive consignments from an overseas supplier are exempt from fumigation, subject to continuing compliance verified through inspection.
- All flowers are inspected on arrival and are fumigated if live quarantine pests are found, regardless of exemption status.
- The benefits to the department are streamlined internal processes for managing fumigation exemptions based on accurate import history and pest data. The biosecurity risk is still managed through inspection and treatment if live pests are found. The system is intended to encourage importers to take measures to reduce the pest load on flowers offshore, before export. Importers can also benefit from a simplified, streamlined process to achieve an exemption.

Mandatory fumigation

2.18 All commercial consignments of cut flowers from the Cook Islands, French Polynesia, Mexico and United States must undergo mandatory methyl bromide fumigation in Australia to address risks associated with insect pests. Fumigation exemptions do not apply to flowers from these countries.

Offshore fumigation treatment providers

2.19 Currently, Australia permits offshore fumigation of cut flowers and foliage in Singapore, Malaysia and supervised fumigations in China. The department does not accredit specific offshore fumigation providers in these countries. The NPPO in the exporting country determines how export facilities will be monitored and compliance with any standards that they apply.

Devitalisation

2.20 Some plant species can be readily propagated from stem, leaf or root material, and the devitalisation procedure renders such live plant material non-viable. Devitalisation is a chemical treatment (dipping in a dilute glyphosate solution) that inhibits or prevents propagation of live plants, thereby reducing the risk of transmission and spread of diseases of biosecurity concern. The IIGB was informed that devitalisation is necessary to reduce the likelihood of transmission of plant pathogens.

2.21 The department's ICON database lists conditions for import of permitted, propagatable cut flowers. Devitalisation treatment must be performed on such species using an approved procedure, either overseas at approved treatment facilities (under agreed schemes) or when the consignments arrive in Australia (Figure 4).

2.22 Offshore devitalisation treatments are performed in exporting countries by treatment providers accredited and/or monitored by their NPPO. On arrival in Australia, a sample of devitalised flowers for every supplier–importer combination is tested each month. This is to provide retrospective verification that treatments have been performed effectively.

2.23 The [Imported cut flower treatment guide](#) and ICON conditions describe the department's cut flower devitalisation requirements for the information of treatment providers and NPPOs.

This guide outlines the dipping procedure, duration (dipping times) and strength of herbicide to be used for devitalisation of material from a particular plant species. For the benefit of department officers sampling imported flower consignments, the guide also describes the appropriate packaging to use when forwarding the samples for propagation testing. It also covers treatment of imported cut roses that have symptoms of powdery mildew.

Accreditation of offshore devitalisation treatment providers

2.24 Devitalisation treatments can be performed in approved countries of origin by accredited treatment providers under NPPO monitoring. The department previously required the in-country NPPO to inspect all offshore devitalisation treatment providers to ensure they had appropriate equipment and understood how to perform devitalisation treatments. The department has now provided NPPOs with guidelines on how the treatment must be performed and the equipment required. The department does not accredit specific treatment providers; it allows the overseas government authority (NPPO) to accredit their own treatment providers and certify those treatments either on a phytosanitary certificate or as an additional, separate declaration. The countries approved by the department to perform offshore devitalisation treatment are listed in Table 2.

Accepted imports

2.25 The ICON database lists countries from which cut flowers may be imported. An exporting country is assessed by considering the biosecurity risks of the species of flowers, assessment of production practices and management measures used as part of the production system in that country. Appropriate risk management measures are imposed to address any identified risks.

2.26 For new species, the process requires a risk assessment (described in 2.27); for previously approved species, a review or extension of policy may be undertaken to extend existing conditions to a new country.

2.27 The department may do an assessment of production systems for newly approved species of cut flowers and new source countries; this would be to verify that flowers for export to Australia meet import conditions and comply with risk management measures and production systems. To date, the department has not undertaken assessment of production systems in any exporting country.

Pre-export requirements in approved countries

2.28 An exporting country is required to manage its export processes in accordance with its own export standards and procedures, and in accordance with international inspection and certification obligations under the IPPC and relevant ISPM standards. A country's export systems and procedures must ensure that any cut flowers requiring phytosanitary certification that are exported to Australia comply with our import requirements.

2.29 Cut flower inspections at the border in Australia form the basis for verifying that imported consignments comply with Australia's import requirements. For approved propagatable species, this is generally verified through propagation tests that are performed on-arrival in Australia

each month on samples taken from imported consignments representing every supplier–importer combination.

2.30 The department may consider auditing an exporting country's export system where a cut flower risk assessment requires application of specific offshore pest mitigation measures. The recently released policy for import of *Lilium* spp. cut flowers from Taiwan (Department of Agriculture 2013) followed a detailed risk assessment for that country and the flower species.

3. Border controls

Administrative controls

3.1 Goods become subject to biosecurity control when the aircraft or vessel carrying the goods enters Australian territory. These goods continue to be subject to biosecurity control until they are released.

3.2 The Plant Import Operations Branch (Biosecurity Plant Division) develops import conditions under which cut flowers may be imported and managed. The assessment of accompanying documents and issuing of AIMS directions is undertaken by Entry Management staff, who are part of the department's Compliance Division. Officers from Plant Services Group in the regions then undertake the inspection and clearance of imports in accordance with import conditions.

3.3 The Plant Import Operations Branch provides departmental officers with technical advice about importation. The Plant Import Operations Branch provides overarching entry management instructional material and technical advice to facilitate imports.

3.4 The Plant Biosecurity Branch assesses quarantine risks associated with importing specific plant species from a specific country. The branch then develops policy and proposes measures to the Plant Import Operations Branch for managing phytosanitary risks associated with specific plant species from the specific country of origin.

3.5 Relationships and the roles and responsibilities of the department's divisions and the responsibilities of the regional offices are shown in Figure 5.

Personal (non-commercial) imports

3.6 Non-commercial consignments of cut flowers (i.e. for personal use) are those imported in small quantities with accompanying passengers or aircrew arriving in Australia. A personal import constitutes up to six small boxes, bouquets or equivalent of fresh cut flowers of the permitted, propagatable and non-propagatable species (appendixes F and G). Commercial import requirements apply for imports exceeding this limit or for cut flowers imported as unaccompanied baggage.

3.7 All non-commercial consignments of permitted, propagatable and permitted, non-propagatable species of fresh cut flowers must be:

- identified by their scientific or common name
- packed in clean, new packaging
- 100 per cent inspected on arrival to ensure freedom from insects, snails, soil, seeds, fruit and other contaminants or disease symptoms.

3.8 All non-commercial consignments from the Cook Islands, French Polynesia, Mexico and the United States must be fumigated with methyl bromide:

- If live pests are found, consignment must be fumigated with methyl bromide, re-exported or destroyed
- If disease symptoms are present, consignments will be re-exported or destroyed
- If seed, berries or other fruits are found they must be removed; alternatively, the consignment must be re-exported or destroyed.

In addition, for permitted, propagatable species, flowers must be devitalised by either pricking the auxiliary buds of all nodes on stems or cutting stems to 5 centimetres below the flower heads.

Commercial imports

3.9 In addition to the import requirements for personal consignments, commercial consignments must also comply with the following requirements, as noted on ICON:

- All consignments must be inspected on arrival (at first port of call) at a quarantine approved premises for quarantine risk material such as live insects, disease symptoms, trash, contaminant seeds, soil and berries/fruits.
- All propagatable and non-propagatable cut flowers require fumigation treatment on arrival unless they have been treated by an approved method of treatment in an approved country of export. Fumigation exemptions are managed through an electronic fumigation exemption 'dashboard'. Consignments must be accompanied by an original phytosanitary certificate that identifies the species by its botanical name. Phytosanitary certificates must meet the department's minimum document requirements policy (DAFF 2012c).
- All propagatable cut flowers require devitalisation treatment on arrival unless they have been treated overseas.
- Consignments must be packed in clean, new packaging and transported in sealed containers.
- Samples may be drawn from imported consignments by department officers for audit of the effectiveness of devitalisation treatment performed in the country of export.

Permitted, propagatable fresh cut flowers

3.10 All permitted propagatable cut flowers must be devitalised on arrival (see Appendix G), with the exception of consignments accompanied by a phytosanitary certificate or separate declaration/certificate endorsed by the NPPO in the approved exporting country (Table 2).

3.11 The department has approved glyphosate (Roundup®) as the only chemical to be used offshore and onshore to devitalise propagatable fresh cut flowers. Glyphosate dosage and dipping requirements for imported cut stems of various species from various countries are described in the department's ICON database (see import case for [Cut flowers/foilage, fresh—permitted-propagatable](#)).

Permitted, non-propagatable fresh cut flowers

3.12 Some fresh cut flowers are exempt from mandatory fumigation under the schemes described in 3.13 to 3.16 only after the approved treatment has been performed in the country of export.

3.13 Malaysian Accreditation Scheme—flowers and tropical foliage species (leaves and fronds) exported by suppliers registered with the Malaysian Crop Protection and Plant Quarantine Services Division are exempt from fumigation on arrival in Australia, provided that no live insects are detected during the on-arrival inspection.

3.14 Singapore–Australia Free Trade Agreement—permitted tropical foliage (leaves and fronds), orchids, anthuriums, dracaena foliage with the stem of the species *Dracaena godsefiana*, *Dracaena marginata*, *Dracaena sanderiana* and *Dracaena reflexa* exported by suppliers registered with the Agriculture and Veterinary Authority of Singapore are exempt from fumigation on arrival in Australia. Furthermore, *Cordyline* spp. foliage with stems is also exempt from devitalisation on arrival, provided it has been devitalised.

3.15 Supervised Fumigation in China Scheme—exemption from fumigation on arrival in Australia for fresh cut flower consignments accompanied by a phytosanitary certificate endorsed by the relevant Chinese Government official stating that fumigation was carried out under their supervision.

3.16 A complete list of permitted, non-propagatable fresh cut flower species is at Appendix H.

Prohibited fresh cut flowers

3.17 All cut flower species that are not listed on ICON as permitted, are prohibited. Any imported consignments of prohibited cut flowers are either re-exported or destroyed.

Verification inspection at the border

3.18 All fresh cut flowers arriving in Australia must be inspected by department inspectors at the first port of entry. In most situations, the inspection occurs at either the department's regional office or at a Class 2.4 quarantine approved premises, which is approved for cut flower inspections and is relatively close to the airport. Import conditions for cut flowers on ICON stipulate various methods for ensuring a consignment is free of insects. However, as IIGB witnessed during fieldwork, some consignments arriving in Australia were packaged in noncompliant cartons that were not insect-proof. The Plant Import Operations Branch have implemented a procedure for certain products (including fresh cut flowers) to be verified by the CTO to ensure the consignment is suitable for movement to the inspection location (internal document, DAFF 2012c). This procedure simply confirms that the packaging is integral (for example, the cartons and pallet are shrink-wrapped) before it can be transported to the inspection location. This procedure only minimises the possibility that live arthropods will escape into the environment, at some time after the aircraft cargo doors have been opened.

Lodgement of imported consignments

3.19 The department uses two interlinked electronic information management systems for clearing fresh cut flowers at the border (Figure 6): the Australian Import Management System

(AIMS), managed by the department, and the ICS, managed by the Australian Customs and Border Protection Service (Customs).

3.20 Goods imported into Australia are classified under the *Customs Tariff Act 1995*. A memorandum of understanding between the department and Customs establishes and supports the collaborative working relationship and defines their respective border protection and biosecurity responsibilities.

3.21 The ICS automatically refers import consignments of biosecurity concern to AIMS. Some of these referrals are based on tariff codes targeted by profiles set by the department. The department uses AIMS to profile, target and record movement of imported consignments as part of arrival clearance procedures. Department officers at the first port of arrival are responsible for clearing imported consignments in their region.

Tariff codes for fresh cut flowers

3.22 Goods imported into Australia require classification under the *Customs Tariff Act 1995*, which is administered by Customs. In general, imported fresh cut flowers are declared under either of these tariff codes:

- 0603 Cut flowers and flower buds of a kind suitable for bouquets or for ornamental purposes, fresh, dried, dyed, bleached, impregnated or otherwise prepared
- 0604 Foliage, branches and other parts of plants, without flowers or flower buds, and grasses, mosses and lichens, being goods of a kind suitable for bouquets or for ornamental purposes, fresh, dried, dyed, bleached, impregnated or otherwise prepared.

3.23 Imported consignments of fresh cut flowers (under tariff codes 0603 and 0604) are automatically directed to the department for biosecurity assessment. At various points in this process, and until the consignments are released, AIMS is updated to reflect any directions imposed and decisions taken as a result of the biosecurity assessment or inspection process.

Client Contact Group

3.24 An importer or broker can book cargo terminal operator (CTO) verification and inspection of imported cargo by contacting the Client Contact Group in each region. Documents relating to imported cargo must be submitted by the importer before a booking can be made. Client Contact Group (CCG) staff inspect the document and make the booking, taking into consideration the nature of the commodity and volume imported, then assign appropriately skilled department staff to inspect the goods.

Packaging requirements

3.25 Biosecurity risks from perishable consignments vary considerably. Some pathways of fresh produce of plant origin are known to be consistently well secured (for example, pre-packed baby corn) and require minimal department intervention before inspection, whereas other pathways (for example, fresh cut roses from Kenya and India) are often found to be infested and/or inadequately packaged.

3.26 The department's policy document for CTO verification of airfreight perishable goods states:

Consignments that arrive unsecured must be secured prior to movement from the CTO. Consignments may be secured by shrink-wrapping, covering with plastic sheeting, loading into an enclosed vehicle etc., or any other means that will restrict the potential escape of insect pests.

3.27 Similarly, the department's ICON database states that all consignments of imported fresh cut flowers must be integrally packaged at the time of arrival; if interpreted literally, this means at the time an aircraft lands and the cargo doors opened. The packaging requirements for imported cut flower consignments as listed on ICON database (accessed on 7 August 2014) are:

Consignments must be packed in clean, new packaging and transported in sealed containers:

- Integral cartons – sealed cartons without ventilation holes.
- Vented cartons with sealed holes. Holes must be sealed with plastic or mesh. Mesh pore size must be no more than 1.6 mm.
- Sealed plastic liners placed inside vented cartons.
- Vials of water attached to the stems of flowers are permitted. Water or ice containers/packs used to cool the flowers are not permitted.

Cartons not meeting these packaging requirements may be imported inside a fully sealed unit. The sealed unit must be transported to the inspection point intact.

Documents and certificates

3.28 From selected records reviewed during fieldwork at regional centres, the IIGB noted that the department's verification system is based on this documentary evidence accompanying the consignments:

- phytosanitary certificate (endorsed by the NPPO in the exporting country) stating that fumigation by an accredited supplier has been applied (Malaysia and Singapore only)
- phytosanitary certificate (endorsed by the NPPO in the exporting country) stating that fumigation has been applied under their supervision (China only)
- phytosanitary certificate or an official declaration (endorsed by the NPPO) stating that devitalisation treatment by an accredited supplier has been applied (for approved countries)
- description of fresh cut flower (common or botanical name) on commercial invoice
- volume in a consignment (number of stems)
- importer and exporter details
- airway bill number/packing list.

3.29 Department officers based in regional offices are responsible for clearing imported consignments by:

- examining consignments of imported cut flowers for live pests, diseases and other quarantine risk material
- facilitating/supervising mandatory treatment (fumigation, devitalisation or both) of imported cut flowers, when required
- making decisions about consignments to be ordered into quarantine, re-treated, released or destroyed (mainly prohibited species)
- sampling cut flowers/foilage treated offshore by accredited suppliers for propagability testing
- managing importer compliance with import requirements for cut flowers
- recording the inspection outcome for each imported consignment after inspection.

Cargo terminal operator verification inspection and clearance

3.30 The department's verification and clearance procedure for personal consignments of imported fresh cut flowers is detailed in Figure 7.

3.31 The standard procedure for border clearance and verification inspection of commercial consignments of imported fresh cut flowers is at Appendix I.

Transport to an approved inspection facility

3.32 Following CTO verification at an airline bond store, fresh cut flower consignments are transported to the inspection location. However, the manner of handling and transportation varies:

- importer/freight forwarder loads the secure airfreight pallets or air containers onto tray trucks and drives them to the inspection location.
- importer/freight forwarder takes consignments out of their integral packaging and puts them into individual packages, loads the packages onto tray trucks or into enclosed vans and takes them to the inspection location.
- importer/freight forwarder collects the consignment and drives it to the inspection location in an enclosed vehicle. Before collection, the importer's vehicle must be sprayed with a 'knockdown' insecticide.

3.33 In all regions, importers must make advance bookings for inspections of cut flower consignments; this is usually done by email.

Sampling for inspection and propagability testing

3.34 The department's Instruction and guideline: imported cut flower clearance (internal document, DAFF 2013b) states how many stems from each carton in a consignment must be examined, as per the routine sampling strategy (Table 3). A 600 unit sampling rate per supplier applies to all imported cut flowers; 600 units from six to 10 randomly drawn cartons are drawn

per phytosanitary certificate (or consignment, if a phytosanitary certificate is not required). The number of cartons and number of stems from each carton may vary depending on the number of suppliers in an entry. Where there are several suppliers and/or several types of flowers in a consignment, cartons must be drawn to include each type and each supplier (see Table 3 for sampling). The 600 unit inspection protocol is used for many fresh produce commodities imported into Australia. It is based on a statistical model and provides assurance about the effectiveness of the department's inspection activities.

3.35 The department also draws five samples of imported propagatable plant material each month for every supplier–importer combination. These samples are used for propagability testing and to provide a history of each country's compliance with devitalisation requirements.

3.36 The IIGB noted that the current regime for devitalisation testing of imported consignments is not to check individual consignments, but rather to provide retrospective verification that overseas exporters are complying with Australian import requirements. Recording such information, through systematic analysis and interpretation, should inform future decisions about the risk-return for this procedure, for this commodity.

Operational Science Support

3.37 To assess the risk posed by imported goods the department has a national Operational Science Support (OSS) network to identify any suspect pests and diseases found on fresh cut flower consignments. The network is part of the department's Compliance Division and provides identification and diagnostic services to inspectors who encounter plant pests and diseases during inspection of imported fresh cut flowers.

3.38 Staff inspecting imported fresh cut flowers prepare samples for transport to OSS laboratories for identification of invertebrates, pathogens and seeds. The department's movement protocol for live/viable quarantinable material for OSS analysis (internal document, DAFF 2013c) outlines procedures to ensure safe and secure transfer between quarantine intervention points and OSS laboratories of live/viable samples.

3.39 In the South East and Central East regions, OSS staff are available on site to advise programmes whether a pest is actionable or non-actionable and provide treatment options.

Quarantine control in Western Australia

3.40 The *Biosecurity and Agriculture Management Act 2007* (WA) underpins plant biosecurity programs to safeguard Western Australia's plant resources from exotic and established pests and diseases. Imported cut flower consignments cleared from quarantine outside WA must be declared before they are brought into the State. Therefore, all imported cut flower consignments moved to WA are subject to inspection and fumigation (when live insects are found) before release. The WA inspection requirements provide an additional check of the efficacy of on-arrival fumigation of imported flower consignments.

4. Observations and findings

Reliance on NPPOs

4.1 The department relies on the integrity and comprehensiveness of controls exercised by exporting country NPPOs in ensuring consignments of fresh cut flowers comply with Australian import requirements. Certification of consignments by the NPPO is required for cut flowers that are treated offshore and/or produced under an overseas accreditation scheme. The department undertakes verification inspections on arrival, to check that offshore treatments are effective. The NPPOs in Singapore and Malaysia accredit export facilities and issue phytosanitary certification for devitalised flowers, stating that Australia's import requirements have been met. Similarly, the China Inspection and Quarantine agency accredits fumigation treatments of cut flower consignments before export to Australia. The department has undertaken specific audits of biosecurity control systems and facilities in Singapore and Malaysia.

4.2 Countries proposing to export cut flowers to Australia are assessed by considering:

- biosecurity risks to Australia of the species of cut flowers
- production practices and management standards that exist as part of the flower production system in that country.

For approval of new cut flower or foliage species, the department requires a risk assessment; for previously approved species, the department may conduct a review or modify policy to extend existing conditions for a new exporting country.

4.3 Assessment of production systems for approval by the department may be carried out for newly approved species of cut flowers and new source countries to verify that flowers for export to Australia would meet import conditions and comply with risk management measures and production systems. However, the department does not accredit specific offshore cut flower export facilities. It is the exporting country NPPO that decides how they manage export facilities and any standards that they wish to apply.

4.4 The department accredited offshore devitalisation treatment facilities until mid 2013, when the policy was amended. However, the department now requires each country's NPPO assess the ability of production facilities to effectively perform devitalisation treatment and certify the treatment on a phytosanitary certificate.

Border clearance and verification inspection

4.5 In three regional offices, the IIGB checked clearance processes for consignments of fresh cut flowers. The IIGB viewed inspection facilities used by the department and, in discussions with officers, gathered information including step-by-step descriptions of the department's verification and clearance procedure for imported flower consignments (Appendix I.)

4.6 From the selected records reviewed during fieldwork at regional centres, it was noted that the department's verification system is based on documents accompanying each consignment:

- phytosanitary certificate issued by the NPPO (for consignments treated offshore)

- devitalisation certificate endorsed by the NPPO (either a separate document or an additional statement on a phytosanitary certificate)
- description of the cut flower species on phytosanitary certificate(s)
- quantities of cut flowers
- botanical or common name of the species imported
- importer and exporter details
- airway bill numbers/invoices/packing lists.

4.7 Department officers based in regional offices clear imported consignments by:

- undertaking verification at CTO premises to ensure the integrity of packaging, and marking those cartons to be inspected at a third-party QAP or the department's premises
- conducting verification inspections
- making decisions about consignments to be ordered for fumigation and/or devitalisation treatment(s)
- ensuring importer compliance with import requirements for fresh cut flowers.

Import requirements

4.8 Australia's import conditions and requirements for cut flowers are listed on the ICON database. The exporting country is required to manage their export processes in accordance with their own export standards and procedures, and in accordance with their international inspection and certification obligations under the IPPC and relevant ISPM standards. A country's export systems also should ensure that cut flowers requiring phytosanitary certification that are exported to Australia comply with Australia's import requirements. Document verification and physical inspection of fresh cut flower consignments on arrival are intended to ensure that consignments comply with Australia's import requirements.

4.9 Cut flower inspections at the border in Australia form the basis for verifying that imported consignments comply with Australia's import requirements. Cut flowers that have been devitalised pre-export are tested under a random sampling program on arrival.

Non-compliant packaging

4.10 One of the import requirements on the department's ICON database for import of fresh cut flowers states that all consignments must be integrally packaged at the time of arrival. Consignments arriving in cartons with open, unmeshed ventilation holes and no closable flaps may contain insect pests that could escape after the aircraft cargo doors have been opened. The risks increase where such consignments are large (some contain more than 200 cartons), due to the increased time needed for handling, and the likelihood of arthropod pests becoming warmer and more active; even during off-peak periods, clearance can take more than two hours.

4.11 During fieldwork, the IIGB noted that several imported consignments had open holes in cartons (Figure 8). Such inadequate packaging provides an opportunity for arthropod pests and other animals of quarantine concern to escape into the environment after arrival of the aircraft. Furthermore, the department currently has no provision to contain consignments that do not conform to packaging requirements. One option would be to shrink-wrap cartons of cut flowers stacked on pallets on arrival at a CTO, to reduce the biosecurity risks. If the additional costs are considered to be unwarranted, the department should undertake a risk review, and if necessary, amend the ICON conditions.

4.12 Department officers appear to have been clearing flower consignments that are not integrally packaged. At one regional office, department staff confirmed that this has been occurring for some time, as officers considered they were unable to reject such consignments. The IIGB was informed that, because an import permit is not required for imported fresh cut flowers, staff believed they did not have adequate legislative powers to reject consignments arriving in non-integral packaging.

4.13 During fieldwork, the IIGB was shown cartons fitted with compliant, flexible mesh covering the ventilation holes; the cost of this carton design was not prohibitive. It appeared that this mesh would remain intact if the holes were used to lift the cartons. The IIGB also saw another carton design, including mesh, which was being trialled by an importer, to comply with the ICON conditions.

4.14 Flowers respire during transit, causing containers to become moist with condensation. Imported consignments of cut flowers are sometimes packaged in poor quality cardboard boxes, which become moist from condensation and can then collapse under the weight. Changes in temperature during transit can increase condensation. For example, consignments transported on flights through the Middle East may be exposed to hot ambient temperatures during transit. Colder conditions on the forward flight could accelerate condensation in the packaging.

4.15 The IIGB was informed that the holding period for imported consignments at one airline bond store could sometimes be prolonged due to breakdowns in the machinery used for moving the consignments from receiving deck to clearing deck. Since the bond store (CTO) often contains imported consignments from different countries, such delays can increase the risk of cross-contamination.

4.16 Departmental officers undertaking CTO verification at the bond area must ensure that all imported consignments that arrive in unsatisfactory packaging are immediately contained; this could be achieved by instructing the importer to shrink-wrap the whole consignment. However, it may not be feasible to shrink-wrap large consignments and it may not be possible to shorten the time taken to clear consignments from bond. As a precautionary measure, the department should consider the installation of insect traps or other devices to intercept or attract insects in airline bond areas where consignments are offloaded.

Recommendation 1

4.17 The department should enforce current requirements for integral packaging of all imported cut flower consignments and give industry advance notice (six to nine months) of its intention to do so. Alternatively, the risks associated with non-integral packaging should be reviewed.

Department's response: Agree.

The department agrees with this recommendation and will review the requirements for integral packaging based on a risk assessment.

Movement of incoming consignments under bond

4.18 Air CTOs undertake a range of activities. In addition to reporting cargo, they may need to move uncleared cargo to another location (licensed customs depot or warehouse) away from their establishment. These moves are reported in the ICS electronically in an underbond movement request. Requirements for underbond movements are mandated by Customs legislation (Australian Customs Service 2014).

4.19 In the regions, department staff reported frequent underbond movement of imported cut flower cargo from CTO premises to third-party establishments for quarantine risk assessment and clearance by department staff. Given that many cut flower consignments arrive at Australian airports in cartons with open holes, underbond movement by Customs should be discouraged because of the high risk of cross-contamination of consignments by exotic pests.

Use of department seals

4.20 After arrival in Australia, cut flower consignments are subject to verification by department staff at CTO premises. After verification, staff release the consignments under department seal, allowing importers to transport consignments from airline bond to a designated quarantine approved premises (QAP) for inspection. A tamper-proof department seal should ensure that the consignment remains under quarantine control until it is cleared and released.

4.21 The IIGB noted different types of seals were used in the South East and Central East regions (Figure 9). In the South East Region, plastic seals used to secure the vehicles appeared to be tamper-proof, weather-proof and reliable. By contrast, in the Central East Region, staff used adhesive paper seals, which they applied to the lock or closing mechanism of the vehicle door. These seals are neither tamper-proof nor weather-proof and can be removed and replaced with relative ease. The IIGB considers that the use of such adhesive paper seals poses a potential biosecurity risk, given their questionable effectiveness. In the South West Region, the department does not use any seals for trucks. In all regions, vehicles used for transport of consignments ordered for fumigation at a QAP (third-party premises) are released without department seal. Further, time taken in transit is not tracked or traced. Inconsistencies in the design and use of department seals pose a potential biosecurity risk.

Recommendation 2

4.22 The department should review the necessity for seals on trucks, applied to provide security for consignments being transported between cargo terminal operators, quarantine approved premises and approved fumigation facilities. If their use is continued, the type of seal should be effective and consistent across regions.

Department's response: Agree.

The department agrees with this recommendation and will consider a review of necessity of seals through the National Service Delivery Program.

Department's response to counterfeit documents

4.23 With the imports of cut flowers increasing, department staff have seen an increase in fraudulent documentation submitted by exporters in some countries. To address this problem, staff across regions have collaborated to produce a guide to aid identification of counterfeit documents.

4.24 Several countries have electronic-certification or e-cert systems that allow Australian quarantine officers to quickly check the authenticity of phytosanitary certificates issued by NPPOs in these countries. The department is commended in its efforts to encourage wider adoption of e-cert.

Efficacy checks after fumigation

4.25 Fresh cut flowers require careful preparation before transport, including packaging to maintain quality and freshness of the produce. For example, stems of cut roses are packaged in a bunch by placing a rectangular piece of cardboard around flower heads and covering the stems with polythene or cellophane sheeting. Several bunches are then packaged in one carton. A single consignment can contain from a few to several hundred cartons.

4.26 Given the amount of packaging material used for imported fresh cut flowers, it is important that fumigation operators use the recommended methyl bromide level and timing. The IIGB noted that, following fumigation treatment, consignments were released and not re-inspected to establish whether or not fumigation treatment was fully effective. This is a weakness in the department's current control systems, given that a significant number of consignments are intercepted with live pests. Each region has recorded instances where fumigation treatment provided by a third party was ineffective, with live insects sometimes found after two fumigation treatments. The need for regular or random post-fumigation efficacy checks should be considered, to establish the effectiveness of fumigation treatments. The department should consider this additional requirement, in the context of its risk-return policy, taking account of the biosecurity risks and the impost of additional costs to industry.

4.27 Fumigation operators are currently required to record readings of methyl bromide concentration at three different levels around a consignment, within the fumigation chamber. There is no requirement to record fumigant concentrations from inside any cartons, particularly towards the centre of the stack, where there is likely to be lower concentrations of fumigant.

The department, in consultation with OSS, could consider revising the relevant work instruction to include checks on treated inspection lots to ensure efficacy of fumigation treatments.

Recommendation 3

4.28 The department should consider the need for regular or random post-fumigation checks for live pests, in the context of its risk-return policy, taking account of the biosecurity risks and the additional regulatory burden on industry.

Department's response: Agree.

The department agrees with this recommendation.

Future use of methyl bromide

4.29 Methyl bromide is a toxic, odourless and colourless gas used as a soil and pest control fumigant across agricultural sectors. Methyl bromide has detrimental effects on the ozone layer. As a signatory to the Montreal Protocol on Substances that Deplete the Ozone Layer, the United States completely phased out importation, production and use of methyl bromide on 1 January 2005. Similarly, the European Union banned use of methyl bromide on 18 March 2010.

4.30 Australia is also a signatory to the Montreal Protocol on Substances that Deplete the Ozone Layer. The protocol currently allows quarantine and pre-shipment (QPS) use of methyl bromide for pest control. It also allows use of methyl bromide by sectors without technically or economically feasible alternatives. Australia uses approximately 690 tonnes of methyl bromide annually for import, export or interstate QPS fumigations, which includes quarantine treatment for traded commodities such as: perishable fruits, fresh flowers, bulbs, nursery stock, seeds for sowing, personal effects (clothes, artefacts, hides, skins and furs), timber items (logs, furniture, building materials, pallets and other manufactured wooden articles), grains and cereals, dried foods, hay, straw and cotton and plant equipment and machinery (Department of Agriculture 2014b).

4.31 The IIGB recognises that low cost and ease of use make methyl bromide a preferred choice over alternative chemicals or treatments. However, the department should provide importers with alternative pest control treatment methods for use with imported cut flower consignments. This will prepare importers for adopting alternative treatment methods when methyl bromide is phased out completely for QPS use. The United States Environmental Protection Agency website lists [methyl bromide alternatives](#) including options for treating roses and ornamentals.

Recommendation 4

4.32 The department should consider reducing its dependence on methyl bromide gas for treatment of pests in imported cut flower consignments, and consider assessment and approval of alternative treatments.

Department's response: Agree.

The department agrees with this recommendation.

The department is working with industry stakeholders and on-shore providers to find alternatives to methyl bromide.

The department notes that methyl bromide is used in a range of other quarantine pathways. Phase out in cut flowers alone will not change the use of the gas on other pathways including by many Australian export industries which rely on the use of methyl bromide for phytosanitary treatments. The department will require strong industry collaboration to implement suitable cost-effective alternatives and a commitment by industry to undertake the required scientific trials and product licensing requirements.

Devitalisation treatment

4.33 For the purposes of propagation testing, department staff routinely select five random samples from each consignment they inspect. Samples represent each supplier–importer combination. Each month, department staff managing Australia-wide entry of various goods insert instructions in the AIMS database against each entry number, reminding inspection staff to take samples from particular consignments.

4.34 If a consignment requires fumigation, the identified samples are first sent for fumigation treatment. Following fumigation, these samples are then tested for devitalisation under the department's supervision, either at the department's QAP facility (in the South East Region) or a designated third-party Class 2.4 QAP (in the South West Region). In the Central East Region, the importer performs devitalisation treatment at the department's premises and under the supervision of department staff. The department recovers the cost of the time spent on supervision of devitalisation treatment from the importer.

Propagation testing

4.35 The way plant material is packaged and transported from the point of collection to the propagation testing facility could reduce the likelihood of successful propagation. In the South West Region, the IIGB noted that the plant material sampled for propagability testing is not packaged properly to ensure vitality of the material, for example, by using an insulated cool box. In addition, couriers transporting samples did not always take a direct route for priority delivery of plant material. On hot summer days in Perth, this could result in plant material quickly losing moisture if it has been in an enclosed vehicle for several hours before delivery. Results from propagation testing of such material would be unreliable.

4.36 The department's audit guide and guidelines for cut flower devitalisation requires pots with cuttings be housed in a misting unit with a heating bed, in a quarantine greenhouse. In the

South West Region, the department has outsourced propagation testing services to the state agriculture department. The IIGB noted that this facility lacked basic requirements for propagation of plant cuttings such as humidity control and a misting unit with a heat bed.

4.37 The IIGB noted that it can take up to a month to get results of propagation testing of sampled plant parts. The release of consignments from quarantine on the day after collection of plant material would appear to be a weakness in current controls. While the department recognises this weakness, the current procedure does provide a retrospective verification of devitalisation. It was noted that the department is considering a review of existing policy for devitalisation.

Recommendation 5

4.38 The department should undertake a review of the existing devitalisation policy and its implementation, and this should occur within the next 18 months.

Department's response: Agree.

The department agrees with this recommendation.

4.39 Rather than having to wait weeks for results of propagability testing, the department should explore alternative options for quicker turnaround. One option is to use a glyphosate testing kit for imported cut flowers. Testing kits are commercially available for testing materials such as residual glyphosate in drinking water, food and soil. The National Measurement Institute is one of several glyphosate testing services in Australia. The IIGB recommends that the department's Operational Science Support investigate the feasibility and cost-effectiveness of using glyphosate testing kits to measure glyphosate concentrations in imported devitalised stems. Alternatively, in consultation with the industry (cost recovery model), samples from imported flower stems could be analysed at an Australian testing laboratory such as the National Measurement Institute.

Sampling for propagation testing

4.40 There appears to be no statistical rationale for drawing only five stems (units) per consignment for propagation testing, when a single consignment may contain more than 50 000 stems (units). The IIGB considers that, as with fumigation efficacy testing in imported consignments, the rate of sampling for propagation testing should be based on a valid statistical model to provide assurance about the effectiveness of propagation testing. Further, the results will be of questionable value if the sampled material in such a low sampling rate is not prepared appropriately for transport to the testing facility and/or the facility lacks basic requirements to support propagation.

4.41 Another reason why the department should base sampling numbers for propagation testing on a statistical model is because nursery stock of several cut flowers and/or foliage species can only be imported through a separate pathway. However, if propagation testing is not undertaken efficiently or there are false negative results, it gives importers a chance to propagate elite species/varieties that would otherwise take up to two years if imported through a nursery stock pathway.

4.42 The Biosecurity Plant Division informed the IIGB that the department is presently investigating the possibility of either removing the requirement for devitalisation, or finding improved ways to test imported cut flower consignments (for effective devitalisation). This work is strongly supported, given that Australia appears to be the only country with this requirement, and the costs to the department and industry.

Effectiveness of devitalisation

4.43 In 2012, approximately 0.66 per cent of imported cut flower consignments failed propagation tests; all had accompanying documentation that declared they had been pre-treated in the country of export (Australian Parliament, Senate 2013). The number of cut flower consignments failing propagation tests may have been higher if:

- sampling were based on statistical modelling rather than on drawing only five random samples each month from imported consignments
- collected samples were properly prepared for transport and delivery to the testing facility to ensure they maintained their vigour
- appropriate facilities were used to provide an optimal environment for plant material to propagate.

4.44 For propagability testing of imported plant material (from stem cuttings), an ideal environment would provide control over temperature and humidity, and suitable lighting for either softwood or hardwood stem cuttings, leaf and root cuttings. The department should ensure that:

- sampling for propagation testing is based on a valid statistical model
- staff follow work instructions when preparing samples designated for external testing
- the facility/conditions for propagability testing are suitable for the type of plant species being tested.

4.45 Because of the risks associated with imported plant material from propagatable plant species, the IIGB advocates use of statistical modelling for sampling, approved packaging techniques for transport of sampled material and appropriate facilities for propagation testing.

4.46 If imported plant species establish in new areas, they could adversely affect agriculture, the natural environment and our lifestyle. The total cost of the impact of weeds on agriculture could be as high as \$4.5 billion annually, with some \$1.7 billion spent each year on mitigation activities such as cultivation and herbicide application (Plant Health Australia 2011). Some imported plant species may also transmit viral diseases of biosecurity concern.

Recommendation 6

4.47 To ensure that devitalisation test results are reliable, the department should ensure that propagation facilities provide optimal conditions for sampled plant material to propagate; optimal conditions should also be maintained during transport of samples.

Department's response: Agree.

The department agrees with this recommendation.

Devitalisation is achieved through the use of glyphosate. Current devitalisation audit testing involves collecting samples, transporting them to Operational Science Services (OSS) laboratories and nurseries for testing and attempting to grow the stems. Training material is currently available to officers to guide the collection and transport of samples for further analysis. Propagation techniques including taking cuttings and growth conditions follow standard horticultural practice to reflect the risk of establishment posed by cut flower stems being discarded whole. To ensure that current collection and transport of sample procedures are adhered to, the department will highlight its importance to staff through the Plant Services Group Inspections Working Group.

To improve this process the department is exploring new devitalisation audit tests that could provide assurance that the treatment has been performed correctly. These tests aim to produce faster and more cost effective results than the current practice.

Industry consultation

4.48 The IIGB undertook fieldwork in the Central East, South East and South West regions and consulted major importers, customs brokers and/or Class 2.4 QAP operators (providing fumigation treatment) in all regions; discussions included some issues only indirectly related to biosecurity. Feedback from industry representatives included requests that the department reduce the time it takes to inspect consignments awaiting quarantine clearance, particularly on weekends and public holidays.

4.49 The department has made progress in clearing imported fresh cut flower consignments on weekends by making an appropriate number of staff available at the importer's request. For all requests for CTO verification of imported consignments and clearance inspection over weekends and public holidays, the department requires importers (or their agents) to email a *Request for out of operating hours inspection* form. This form requires an importer to pay a higher rate for inspections requested out of normal operating hours. It was also noted that the department does not provide diagnostic services and assessment of biosecurity risk on weekends or public holidays. Importers who need to process consignments on weekends often feel obliged to choose mandatory fumigation because diagnostic services are not available.

4.50 During discussions, industry representatives expressed concern about the mandatory requirement to present the original phytosanitary certificate at the time of inspection. Accompanying documents (including original phytosanitary certificates) are sometimes separated from consignments as a result of delays or transfers between ships and ports. To take the delivery of the consignment, the importer must request another copy of the phytosanitary

certificate for the exporting country NPPO; this is often emailed directly by the NPPO to the department, following which the border clearance (CTO verification) and subsequent inspections take place. The IIGB recognises that by not accepting duplicate copies of phytosanitary certificates from the importer, the department is exercising caution because only original certificates have security features that staff can authenticate. It was noted that, to address this issue, the department is considering a review of document requirements for imported cut flower consignments. For staff training purposes, the department has developed a series of slides identifying the security features in phytosanitary certificates issued by approved exporting countries.

Performance of information technology system

4.51 The department uses integrated and networked information technology systems across all regions to manage clearance of imported consignments. The AIMS database is routinely used across the regions and managed by the department's Information Services Division Import Applications Administrator. AIMS is integrated into the ICS, which is managed by Customs. The cut flowers fumigation exemption 'dashboard' that is interfaced with AIMS enables department staff to check the compliance history of overseas suppliers and make decisions about whether a particular consignment should be ordered for fumigation treatment.

4.52 Department staff in the regions use AIMS to record, in real time, processes such as entry management, point-to-point movement of imported goods and inspection findings. Any outage to ICS or AIMS delays the clearance of cargo until the problem is resolved. In one region, the IIGB was advised that downtimes in the department's information technology system sometimes disrupt quarantine operations and reduce productivity. The department's regional Cargo Business Continuity Plan does identify key staff in the region and the necessary steps to enable timely resolution of outage issues.

4.53 Unannounced outages to ICS or AIMS frustrate importers because of the costs associated with delays in inspection and release of consignments. During outages, as noted in one of the work instructions for fresh cut flowers, importers who want to avoid further delays can choose to have consignments fumigated—even those consignments might be imported from a reputable supplier with a good compliance history.

4.54 The IIGB noted that IT downtimes in the regions can be the result of technical malfunctions or updates being applied to networked systems by Information Services staff at central office, Canberra. Information Services staff usually apply system updates during non-business hours. However, because the east coast is two hours ahead of Western Australia, these updates can sometimes result in system outages during business hours in the South West Region.

Department's premises used as a quarantine approved premises

4.55 Across regions, the IIGB noted some inconsistencies in the use of departmental premises for inspection of imported fresh cut flowers. In the South East Region, department premises used for inspection of imported cut flowers are not classified as QAP Class 2.4— a departmental requirement for inspection of fresh cut flowers at all third-party premises. In contrast, in the

Central East Region department premises are exempt, under section 46A of the *Quarantine Act 1908*, as a place where goods of 20.2 quarantine containment level 2 facilities may be treated or otherwise dealt with. In the Central East Region, approval of the premises expired seven months before the IIGB's visit to the region. In contrast, in the South West Region, most inspections are carried out at third-party premises.

Staff non-compliance with standard operating procedures and work instructions

4.56 The department has developed standard operating procedures, work instructions and/or guidelines that department officers follow when undertaking the entry management process, post-border quarantine inspections and management of QAPs. The IIGB noted that standard operating procedures and work instructions relating to entry management, CTO verification and inspection of imported fresh cut flowers were clear and adequate for detecting pests and quarantine risk material in order to minimise entry into Australia.

4.57 However, it was noted that staff undertaking CTO verification at an airline bond store (CTO) overlooked the requirement for integral packaging and cleared through quarantine several large consignments containing cartons with open ventilation holes. Although these consignments were subsequently loaded onto enclosed trucks, they arrived and were held at the CTO, with open ventilation holes in cartons.

4.58 IIGB noted that during inspection of one of the imported consignments in the South East Region, staff did not follow work instructions to examine 90 per cent of flowers from the representative sample under a magnifying lamp for detecting the presence of microscopic pests and/or signs of infection/infestation.

Inspection record and record keeping

4.59 The department's work instruction for imported cut flower clearance (internal document, DAFF 2013b) requires staff to complete an inspection record for each imported consignment of cut flowers before release from quarantine. The information recorded includes, for example, date of inspection, CTO verification seal number, sampling details for verification inspection, selection of samples for propagability testing (as applicable), inspection team details, whether or not the ICON database has been checked to confirm import requirements, pest and disease intervention record and date of clearance of goods from quarantine. The instruction and guideline requires the lead officer to ensure completion of an inspection sheet.

5. Case studies

Offshore fieldwork

5.1 During the past 20 years, imports of cut flowers have steadily increased in volume, accounting for a significant proportion of Australian flower consumption. Industry representatives have expressed concern about the biosecurity risks associated with imports, particularly from countries where the use and control of pesticides and other chemicals might not meet Australian standards. To gain some understanding of these risks, the IIGB visited Kenya in May 2014. At all locations, government and private organisations gave the IIGB assistance and information and permitted him to photograph facilities, procedures and signage (Figures 10–15).

5.2 The IIGB met officials of the Kenya Plant Health Inspectorate Service (KEPHIS), Kenya's NPPO, to discuss the Kenyan Government's role in overseeing flower production and ensuring compliance with requirements of importing countries, interactions with industry, disease surveillance, accreditation of treatment facilities, and pre-export inspections aimed at addressing biosecurity risks before cut flowers reach Australia. He also observed pre-export inspections by KEPHIS officials at several locations at or near Jomo Kenyatta International Airport, Nairobi.

5.3 In addition, the IIGB visited five commercial flower farms of varying size in two regions, to inspect production processes and assess the general standard of management. These inspections and discussions with managers and staff gave the IIGB a reasonable understanding of the capacity of Kenya's cut flower industry to meet Australia's import requirements.

Kenya Plant Health Inspectorate Service (KEPHIS)

5.4 KEPHIS Head Office, Nairobi—Dr Esther Kimani (General Manager Phytosanitary Services) and Dr Mary Githingi (Senior Inspector Phytosanitary Services) (Figure 16)

- KEPHIS employs 120 inspectors, most of whom hold Diplomas of Horticulture and a few who have Bachelor of Science degrees.
- KEPHIS is keen to strengthen relationships with Australia and gain a better understanding of our import requirements. While KEPHIS is responsible for phytosanitary certificates, export licences are issued by the [Horticultural Crops Development Authority](#).
- KEPHIS undertakes property inspections to ensure compliance with the requirements of particular markets, such as on-farm devitalisation facilities. Audits are undertaken every three months; KEPHIS provided the IIGB with copies of audit and industry commitment forms.
- The Kenya Standing Technical Committee on Import and Export supervises and facilitates the importation of biological control agents and undertakes relevant risk assessments. KEPHIS provides the secretariat and liaises with other government agencies.

- KEPHIS also oversees and approves research facilities such as universities, the Kenya Agricultural Research Institute and International Centre of Insect Physiology and Ecology.
- KEPHIS operates a diagnostic laboratory for identification of insects and plant pathogens.
- Training of industry personnel generally focuses on specific incidents, such as reports of non-compliance, and the remedial action required to address those issues. Most training is provided on farm because of the distances farm staff would have to travel to attend courses in Nairobi.
- Most communication with industry is through email.
- KEPHIS has a good working relationship with the Kenya Flower Council; 90 per cent of exporters are members of the Council.
- KEPHIS expressed concern about an incident in January 2014, when inspectors in Australia detected insects in a flower consignment from Kenya. No identification was provided by the department, so the KEPHIS was unable to take follow-up remedial action.
- KEPHIS queried the scientific justification for devitalisation of roses—they understand that Australia is the only country that has this requirement.

5.5 Jomo Kenyatta International Airport, Nairobi—Kennedy Onchuru (Principal Inspector and Officer in Charge) and Hilda Chelangat (Inspector)

- Air cargo exports (perishables) are in the proportion flowers: vegetables: fruit = 6 : 4 : 1. Approximately 500 tonnes of flowers, mostly roses plus some carnations and other species, are exported by air daily; this doubles before Mother's Day and St Valentine's Day.
- Approximately 24 inspectors are based at the airport. They are responsible for inspections at 27 customs agents' premises at the airport and 100 premises outside the airport. Each inspector is rotated through six zones.
- Inspectors work two shifts: 8 am to 5 pm and 2 pm to midnight.
- New recruits receive two months training and inspectors attend regular refresher courses, such as an all-day workshop on customer relations. All inspectors are scored on their performance.
- Pre-export inspections are generally done in a dedicated area, with a computer connected to the KEPHIS mainframe. Some inspection areas were slightly cramped and were not equipped with magnifying lamps or microscopes. Inspectors carry a small portable kit for collection of animal or plant samples.
- Following an inspection, KEPHIS issues a phytosanitary certificate. If a consignment fails inspection, an exporter may lodge an appeal; the consignment is then re-assessed by a panel of three inspectors, including the initial inspector.

Commercial flower production

5.6 The IIGB visited five flower farms:

- [Finlays Horticulture Kenya Ltd](#), Naivasha—Ms Karen Rono (Technical and Innovations Manager) and Tom Mason (Director)
- [Oserian Development Company Ltd](#), Naivasha—Mr Hamish Ker (Director and Head of Special Projects), Dr Kenneth Nairobi (Head, Supply Chain Division) and four managers
- [Penta Flowers](#), Nairobi—Ms Sabine Kontos (Managing Director), Mr Thomas Ochieng (Director) and key staff
- [Red Lands Roses](#), Ruiru—Isabelle Spindler (Managing Director) and key managers
- [Waridi Farm](#), Nairobi—Mr Jeremy Mott (CEO), Mr PD Kadlag (General Manager), Andrew Cameron (Manager) and Ms Zing Yeo (Technical Manager).

5.7 The largest farm (Oserian) has 60 hectares of greenhouses, heated by the company's geothermal power station. Oserian employs approximately 4500 staff, who have access to the company's school and hospital. The smallest farm has 15 hectares of greenhouses, with an additional 2 hectares under construction; this farm employs 400 people.

- All growers participate in multiple independent audit programmes, covering all facets of their production. All operations are certified by ISO 9001:2008, Fairtrade, Milieu Programma Sierteelt (MPS GAP), British Ornamental Plant Producers, Kenya Flower Council (KFC) and the Kenya National Environment Management Authority.
- Modern technology and best-practice management practices appear to have been widely adopted; for example, integrated pest management.
- The management of the farms visited showed a strong commitment to minimising use of pesticides and other chemicals. This is driven by environmental, OH&S and economic pressures, plus concerns about the adverse environmental effects of the flower industry, particularly around Lake Naivasha. Routine audit checks are conducted in Kenya and overseas importing countries such as the Netherlands, Germany and the United Kingdom.
- At Waridi Farm, waste water is biologically treated through a series of artificial ponds, set in an extensive tropical garden.
- At the five establishments visited, standards of management appear to be uniformly high, with a commitment to maintaining the quality and reputation of their product.
- KEPHIS and other external organisations provide farm staff with training programmes on greenhouse and packing shed skills.

5.8 Other meetings

[Kenya Flower Council](#)—Jane Ngige (Chief Executive). KFC is a voluntary association of independent growers and exporters of cut flowers and ornamentals. It was formed in 1996 to foster 'responsible and safe production of cut flowers in Kenya, with due consideration of workers' welfare and protection of the environment'.

As of February 2014 KFC had a producer membership of 72 flower farms, representing about 50 per cent to 60 per cent of flowers exported from Kenya. Associate membership comprises 50 representatives of major cut flower auctions and distributors in the United Kingdom, Holland, Switzerland, Germany and Kenya.

- The KFC Code of Practice is benchmarked against GlobalGAP and Fair Flowers, Fair Plants. KFC has begun benchmarking against several other auditing programmes—Tesco's Nature, MPS-SQ, MPS-Social, MPS-ABC and Rainforest. KFC is also an agent for the Kenya Bureau of Standards KS-1758.
- Industry self-regulation is administered through the KFC Code of Practice. KFC certification operates on two levels: silver and gold; both levels detail the standards required from participants. Apart from annual certification audits, KFC also does unannounced audits on 10 per cent of certified producers annually. The IIGB was informed that the KFC Code of Practice is reviewed every two years to incorporate changes to environmental, regulatory and international requirements.

[Kuehne + Nagel Ltd](#), customs agents and freight forwarders, Jomo Kenyatta International Airport, Nairobi—Mr Myles Hechle (Regional Manager). IIGB discussed the logistics of exporting large volumes of a highly perishable commodity, including coordinating KEPHIS inspections and booking air cargo space.

Summary

5.9 Based on the facilities visited and discussions with relevant industry and government personnel, it appears that the Kenyan flower industry is generally well organised, with good standards of management. Working relationships between industry and government (KEPHIS) appear to be positive. The flower industry contributes 38 per cent of Kenya's GDP, and its importance to the national economy is recognised and respected by those industry personnel who met with the IIGB.

Appendix A: Agency response



Australian Government
Department of Agriculture

SECRETARY

Ref: EC14-000114

Dr Michael Bond
Interim Inspector-General of Biosecurity
GPO Box 858
CANBERRA ACT 2600

Dear Dr Bond

Thank you for the opportunity to consider the audit report, *Effectiveness of biosecurity controls for imported fresh cut flowers*.

Please find enclosed the department's response to each of the recommendations you have made.

The department accepts the recommendations to examine the risk mitigation measures currently used along the cut flower pathway to ensure that biosecurity risks are managed; and endorses the conclusion that while there are some areas for possible improvement, the department is managing relevant biosecurity risks in an appropriate manner.

I do not believe that any of the information contained in the report could be considered as prejudicial to the public interest and should not be made publicly available.

Yours sincerely

A handwritten signature in dark ink, appearing to be 'P. Grimes'.

Paul Grimes

23 December 2014

Enc. 1- Departmental Response to the Recommendations

ENCLOSURE 1

DEPARTMENTAL RESPONSE TO THE RECOMMENDATIONS

The department considers that the audit report, *Effectiveness of biosecurity controls for imported fresh cut flowers*, provides a comprehensive evaluation of the department's effectiveness in managing the biosecurity risks of the pathway.

The report emphasises that the department uses a systems approach to manage biosecurity risks. Ensuring the safe importation of material which poses a biosecurity risk is a primary goal of the department. The department's role in risk management and regulation applies across all import pathways including – passengers, mail, air and sea cargo. Biosecurity risks are managed offshore, at the border, and within Australia—the biosecurity continuum—at the point where intervention is most effective.

Response to recommendations:

Recommendation 1: Agreed

The department should enforce current requirements for integral packaging of all imported cut flower consignments and give industry advance notice (six to nine months) of its intention to do so. Alternatively, the risks associated with non-integral packaging should be reviewed.

The department **agrees** with this recommendation and will review the requirements for integral packaging based on a risk assessment.

Recommendation 2: Agreed

The department should review the necessity for seals on trucks, applied to provide security for consignments being transported between cargo terminal operators, quarantine approved premises and approved fumigation facilities. If their use is continued, the type of seal should be effective and consistent across regions.

The department **agrees** with this recommendation and will consider a review of the necessity of seals through the National Service Delivery Program.

Recommendation 3: Agreed

The department should consider the need for regular or random post-fumigation checks for live pests, in the context of its risk-return policy, taking account of the biosecurity risks and the additional regulatory burden on industry.

The department **agrees** with this recommendation.

Recommendation 4: Agreed

The department should consider reducing its dependence on methyl bromide gas for treatment of pests in imported cut flower consignments, and consider the assessment and approval of alternative treatments.

The department **agrees** with this recommendation.

The department is working with industry stakeholders and on-shore providers to find alternatives to methyl bromide.

The department notes that methyl bromide is used in a range of other quarantine pathways. Phase out in cut flowers alone will not change the use of the gas on other pathways including by many Australian export industries which rely on the use of methyl bromide for phytosanitary treatments. The department will require strong industry collaboration to implement suitable cost-effective alternatives and a commitment by industry to undertake the required scientific trials and product licensing requirements.

Recommendation 5: Agreed.

The department should undertake a review of the existing devitalisation policy and its implementation, and this should occur within the next 18 months.

The department **agrees** with this recommendation.

Recommendation 6: Agreed

To ensure that devitalisation test results are reliable, the department should ensure that propagation facilities provide optimal conditions for sampled plant material to propagate; optimal conditions should also be maintained during transport of samples.

The department **agrees** with this recommendation.

Devitalisation is achieved through the use of glyphosate. Current devitalisation audit testing involves collecting samples, transporting them to Operational Science Services (OSS) laboratories and nurseries for testing and attempting to grow the stems. Training material is currently available to officers to guide the collection and transport of samples for further analysis. Propagation techniques including taking cuttings and growth conditions follow standard horticultural practice to reflect the risk of establishment posed by cut flowers stems being discarded whole. To ensure that current collection and transport of sample procedures are adhered to, the department will highlight its importance to staff through the Plant Services Group Inspections Working Group.

To improve this process the department is exploring new devitalisation audit tests that could provide assurance that the treatment has been performed correctly. These tests aim to produce faster and more cost effective results than the current practice.

Appendix B: High risk plant diseases and insect pests associated with imported cut flowers and foliage

Rose rust

- Rose blooms imported from Japan may be infected by the rust *Kuehneola japonica*, which is of quarantine concern for Australia.

Powdery mildew

- Powdery mildew is a fungal disease that affects a wide range of plants. It is caused by many different species of fungi.
- The disease is characterised by spots or patches of white to greyish, talcum-powder-like growth. It is most commonly observed on the upper sides of leaves, although it also affects the bottom sides of leaves, young stems, buds and flowers.
- Not all powdery mildew species require action; for example, *Erysiphe simulans* var. *simulans* (*Uncinuliella simulans*: Anamorph: *Oidium rosae-indicae*) has been recorded from Japan, China, the Russian Federation, Korea and Taiwan. Non-actionable species include *Podosphaera pannosa* (*Sphaerotheca pannosa*: Anamorph: *Oidium leucoconium*).

Powdery mildew of *Gypsophila* *Oidium* spp.

- *Gypsophila* spp. may be affected by powdery mildew of *Gypsophila* (*Oidium* spp.), which does not occur in Australia but has been recorded in Israel.

Botrytis diseases on *Allium* spp.

- Several botrytis species such as *Botrytis allii*, *B. cinerea* and *B. squamosa* can occur on garlic and onion produce including garlic shoots, garlic bulbs, onion bulbs and cut flower alliums. Of these, *B. squamosa* is of quarantine concern for Australia and will require action if detected on *Allium* spp. cut flowers/foliage.

Sudden oak death

- Sudden oak death is a fungal disease caused by the plant pathogen *Phytophthora ramorum*.
- The disease can be transmitted by plant material infected by this pathogen. The importation of species that are a host of *P. ramorum* is not permitted from countries affected by this disease.

Leaf mining flies *Lyriomyza* spp.

- Hosts: *Gypsophila* spp. and *Chrysanthemum* spp.
- Distribution: North or South America, Europe (including the United Kingdom), Africa, Mauritius, Canary Islands and Reunion Islands, Israel and West Indies.
- Due to the risk of introducing leaf mining flies, *Lyriomyza* spp., chrysanthemums and gypsophila flowers must be fumigated with methyl bromide at 32g/m³ for two hours at 21 °C. Pre-shipment fumigation certified by an official phytosanitary certificate is acceptable.

Appendix C: High risk commodities and/or country pathways requiring mandatory cargo terminal operator verification at first port of entry

Commodity	Country pathway
Cut flowers	All countries
Capsicums (not pre-cleared)	New Zealand
Citrus	All permitted sources
Asparagus	All countries
Grapes (on-arrival fumigation only)	United States
Mangoes	India and Pakistan
Nursery stock	All countries
Snow peas	African sources
Taro	South Pacific Commission countries
Tropical fruits (mangosteen, longan, lychee)	South-East Asian sources

Source: Australian Government Department of Agriculture, Canberra

Appendix D: References to imported cut flowers and foliage in the *Quarantine Act 1908* and Quarantine Proclamation 1998

The *Quarantine Act 1908* provides:

- The legal basis for preventing or controlling the entry of plants into Australia.
- The legal basis for managing the quarantine risk arising from plants after arrival in Australia.
- The powers for the Director of Quarantine and quarantine officers to deal with quarantine matters.
- Outlines the responsibilities of quarantine officers.
- Offences and maximum penalties for contraventions of the Act.

A quarantine officer can only operate within the scope allowed by the Act and its subordinate legislation. Activities that fall outside the scope of the Act can be challenged, bringing the Australian Government Department of Agriculture into disrepute.

Importation of other plant parts

Part 7, Division 3, Schedule 6, section 65(2) of the Quarantine Proclamation 1998 states:

The importation into Australia of a plant or plant part of a kind mentioned in Schedule 6 (whether or not capable of being used for propagation) is prohibited unless a Director of Quarantine has granted a permit for the importation.

Treatment and destruction of goods

Part IV, Division 2, section 48AA of the Act states:

Application

(1) This section applies to any goods that are required under this Act to be treated.

Power to destroy goods

(2) Subject to subsection (3), if a quarantine officer believes on reasonable grounds that the goods cannot be effectively treated, he or she may cause them to be destroyed.

Ministerial approval for destruction of goods

(3) If the value of any goods to which subsection (2) applies exceeds:

- (a) unless paragraph (b) applies—\$1,000; or
- (b) if a higher amount is prescribed by the regulations—the higher amount; the goods must not be destroyed without the written approval of the Minister.

Request to owner or agent to agree to treatment of goods

(4) If a quarantine officer believes on reasonable grounds that the goods cannot be effectively treated without damaging them, the quarantine officer must, by notice in writing given to the owner of the goods or the agent of the owner, tell the owner or agent that the treatment is likely to damage the goods and request the owner or agent to agree to the goods being treated.

Forfeiture of untreated goods

(5) If:

- (a) a notice is given to the owner of goods or the agent of the owner under subsection (4); and

(b) the owner or agent does not, before the end of 30 days after the day on which the owner or agent receives the notice, give written notice to a Director of Quarantine stating that the owner or agent agrees to the goods being treated; the goods are forfeited to the Commonwealth and a quarantine officer may seize them and cause them to be sold, destroyed, exported from Australia or otherwise disposed of.

Examination of plants on importation

Part V, section 53 of the *Quarantine Act 1908* states:

- (1) A quarantine officer or an authorised person may examine any imported plant that has not been released from quarantine.
- (2) A quarantine officer must:
 - (a) if he or she is of the opinion that there is an unacceptably high level of quarantine risk in respect of the plant—order the plant into quarantine; or
 - (b) otherwise—release the plant from quarantine.

Power to order goods into quarantine

Part V, section 55A of the Act states:

- (1) A quarantine officer may:
 - (a) examine any goods to which this section applies; and
 - (b) order into quarantine any of the goods that, in the officer's opinion:
 - (i) are, or are likely to be, infected with a disease or pest; or
 - (ii) contain, or appear to contain, any disease or pest; or
 - (iii) have been exposed to infection from a disease or pest.
- (2) This section applies to:
 - (a) imported animals and plants, whether subject to quarantine or otherwise;
 - (aa) other imported goods, whether subject to quarantine or otherwise; and
 - (b) any other goods that have been or are, or that an officer has reasonable cause to believe have been or are, on board any of the following:
 - (i) an overseas vessel;
 - (ia) a vessel that travels to a place in Australia from or through a place in the Protected Zone;
 - (ib) a vessel that travels to a place in Australia from or through a Special Quarantine Zone in respect of Australia;
 - (ic) a vessel that travels to a place in the Cocos Islands from or through a Special Quarantine Zone in respect of the Cocos Islands;
 - (id) a vessel that travels to a place in Christmas Island from or through a Special Quarantine Zone in respect of Christmas Island;
 - (ii) an overseas installation;
 - (iii) an Australian vessel subject to quarantine;
 - (iv) a Cocos Islands vessel subject to quarantine;
 - (iva) a Christmas Island vessel subject to quarantine;
 - (v) an Australian resources installation, or a resources installation that is in Australian waters for the purpose of becoming attached to the Australian seabed, subject to quarantine;

(vi) an Australian sea installation, or a sea installation that is in Australian waters for the purpose of becoming installed in an adjacent area or in a coastal area, subject to quarantine.

Seizure of animals, plants or other goods

Part VII Miscellaneous, section 69 of the Act states:

(1) If any animals, plants or other goods that are subject to quarantine are found at a place other than a quarantine station:

- (a) any officer or police officer may seize them; and
- (b) if an officer or police officer does so—he or she must take them to a quarantine station or to such other place as a Director of Quarantine directs.

(2) If an animal that is required to be kept under quarantine surveillance at a particular place (the *place of surveillance*) is found at another place:

- (a) any officer or police officer may seize it; and
- (b) if an officer or police officer does so—he or she must take it back to the place of surveillance or to such other place as a Director of Quarantine directs.

Appendix E: Notice to industry—pilot of automated fumigation exemptions for cut flowers



Australian Government
Department of Agriculture, Fisheries and Forestry

Notice to Industry

97/2012

18 December 2012

Pilot of automated fumigation exemptions for imported cut flowers

Who does this notice affect?

This notice is to advise importers of fresh cut flowers and foliage that a pilot of an automated system for cut flower fumigation exemptions will commence in Sydney from 14 January 2013.

What is the cut flower fumigation exemption pilot?

The Department of Agriculture, Fisheries and Forestry (DAFF) has developed an automated system to manage cut flower fumigation exemptions based on importer and supplier compliance history. The system has been designed to replace [Importer Initiated Pathway Fumigation Exemptions \(IIPFE\)](#) and to extend fumigation exemptions to all cut flower pathways that consistently comply with DAFF's requirement for freedom from live pests and other biosecurity risk materials.

In preparation for the pilot DAFF has been collecting data on importer-supplier compliance for cut flower imports since August 2012. Pathways that meet the requirements for fumigation exemption as explained below will have this compliance recognised by becoming exempt when the pilot commences.

The pilot will run for three months, followed by an evaluation with possible extension to all regions receiving imported cut flowers dependent on the results.

What's changing?

The table below outlines the changes that importers will experience during the pilot

Now	Pilot
Importers must apply for a fumigation exemption for a pathway consisting of importer, supplier and the type of flower being imported	<p>The import pathway used by the system is limited to the importer and supplier combination in AIMS, the type of flower is not a part of the pathway</p> <p>Inspection results are used to automatically determine that a pathway is exempt from mandatory fumigation</p> <p>Flowers can only be considered as separate pathways (i.e. from different suppliers) if separate quarantine entries are lodged for each supplier. This is necessary for the operation of the automated system</p>
A pathway trial requires ten consignments free from pest before an exemption is granted	Pathways can become exempt from mandatory fumigation after three consecutive consignments where no actionable pests and no other biosecurity issues are detected
Pathways are exempt from fumigation during "pathway trials"	Mandatory fumigation will be performed on new pathways until three consignments have been inspected and found to

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Now	Pilot
	be free from live pests and other risk materials Compliance must be demonstrated before an exemption is granted
IIPFE have a complex system for probation and suspension of pathways	Once a pathway is exempt, it will maintain that status until three consecutive failures have been recorded; failures will be fumigated as per ICON After three failures the pathway will be subject to mandatory fumigation When a pathway is subject to mandatory fumigation due to failures, five consignments must be imported free from biosecurity risk material before the exemption recommences
Flowers on exempt pathways are subject to fumigation if issues are identified at inspection	Flowers on exempt pathways are subject to fumigation if issues are identified at inspection
Inspections are based on the number of cartons and the flowers and foliage lines on the Phytosanitary certificate or commercial invoice	A 600 unit inspection will be completed on imported cut flowers during the trial

Importers are encouraged to implement measures to manage pest issues offshore as the import pathway can be exempted from mandatory fumigation once a history of compliant imports has been established.

Further information

Further information on the pilot is available on the [DAFF website](#).

To discuss the pilot or the exemption status of import pathways contact Plant Import Operations by emailing plantwquar@daff.gov.au or phoning (02) 6272 3917.

Appendix F: Notice to industry—changes to imported cut flower fumigation requirements



Australian Government

Department of Agriculture, Fisheries and Forestry

Notice to Industry

19/2013

10 April 2013

Changes to imported cut flower fumigation requirements

Who does this notice affect?

This notice is an update to Notice to Industry [\(97-2012\)](#) to advise importers of fresh cut flowers and foliage that the pilot system for cut flower fumigation exemptions will be extended Australia-wide from **1 June 2013**.

What is changing?

Since 14 January 2013 DAFF has been piloting an automated system in the Central East Region for determining whether imported cut flower consignments qualify for exemption from mandatory fumigation. The system replaces all previous flower fumigation exemption schemes and determines exemptions for import pathways that have demonstrated a history of being pest and disease free.

Following an evaluation of the pilot, the number of pest and disease free consignments required to achieve a fumigation exemption has increased from three to five. If there are three consecutive failures on an exempt pathway, it will return to mandatory fumigation until five pest and disease free consignments have been imported.

Pathways that meet the requirements for fumigation exemption as described above will have this compliance recognised by becoming exempt when the pilot starts.

Pathways exempted under previous schemes that have no history of imports between 1 August 2012 and 1 September 2013 will be discontinued from 1 September 2013.

These changes do not affect fumigation exemptions for imports from the Malaysia and Singapore Overseas Accreditation Schemes.

Further information

Further information on the pilot.

To discuss the pilot or the exemption status of import pathways [email Plant Import Operations](#) or phone (02) 6272 3917.

Appendix G: Permitted, propagatable cut flowers and foliage species devitalised on arrival

Consignments accompanied by a phytosanitary certificate endorsed by an approved exporting country's National Plant Protection Organisation are exempt from onshore devitalisation treatment (using glyphosate) unless live pests/disease symptoms are found on inspection. Glyphosate dosage and dipping requirements vary between species.

Botanical name	Common name	Permitted source/country	Notes
Brunia spp.	–	All countries	–
Calathea lancifolia (synonym Calathea insignis)	–	All countries	Foliage only – devitalisation is not required if leaves do not contain stem material
Callistemon spp.	Bottle brush	New Zealand	–
Callistephus chinensis	Callistephus	All countries	–
Chrysanthemum spp.	Chrysanthemum	Indonesia, Colombia, Israel, Malaysia, Netherlands, Republic of South Africa, Vietnam, Zimbabwe India (flower head and petals only, excluding stems)	–
Codiaeum variegatum (synonym Croton variegates)	–	All countries	Croton stems require devitalisation; leaves do not require devitalisation treatment
Cordyline spp.	–	Singapore, Malaysia	Foliage with stem permitted
Dianthus spp.	Carnations	All countries	–
Dracaena spp. (with stem)	Dracaena, dragon tree	Singapore, Malaysia	Exempt from devitalisation
Hypericum spp.	–	All countries	Hypericum x indorum Flair varieties are permitted with berries or fruits attached
Oxypetalum spp. (synonym Tweedia spp.)	Baby blue	All countries	–
Rhapis spp.	–	Countries other than Canada, United States and European countries	Leaves and fronds do not require devitalisation; however, leaves attached to a basal stem will require devitalisation
Rosa spp.	Rose	Countries other than Canada, United States and European countries	–
Ruscus spp.	–	All countries	Foliage only
Tweedia spp. (synonym Oxypetalum spp.)	Baby blue	All countries	–
Viburnum spp.	–	Countries other than Canada, United States and European countries	–
Viola spp.	Violet	All countries	–

Source: Import conditions database, Australian Government Department of Agriculture, Canberra

Appendix H: Permitted, non-propagatable fresh cut flowers and foliage species fumigated on arrival

Consignments accompanied by a phytosanitary certificate endorsed by an approved exporting country's National Plant Protection Organisation are exempt from onshore fumigation treatment.

Table H1 Permitted, non-propagatable fresh cut flowers and foliage species fumigated on arrival

Cut flower/foliage species	Common name	Permitted from (specific countries only)
<i>Agapanthus</i> spp.	Lily of the Nile African lily	All countries
<i>Alcea</i> spp.	Hollyhock	All countries
<i>Allium</i> spp.	Allium, onion flower	All countries
<i>Alstroemeria</i> spp.	Lily of the Incas, Peruvian lily	All countries
<i>Althaea</i> spp.	Hollyhock, marshmallow	All countries
<i>Alyxia stellata</i>	Maile	Tonga
<i>Amaranthus</i> spp.	Amaranth, love-lies-bleeding, princess feather	All countries
<i>Amaryllis</i> spp.	Belladonna lily	All countries
<i>Ammi majus</i>	Queen Anne's lace, bishop's weed	All countries
<i>Anemone</i> spp.	Lily of the field, wind flower	All countries
<i>Anigozanthos</i> spp.	Kangaroo paw	All countries
<i>Anthurium</i> spp.	Anthurium, tailflower	All countries
<i>Asplenium nidus</i> (leaves)	Birds-nest fern	All countries
<i>Astilbe</i> spp.	Spiraea	All countries
<i>Campanula</i> spp.	Bell flowers	All countries
<i>Chelone</i> spp.	Turtle head, snake head	All countries
<i>Consolida</i> spp.	Larkspur	All countries
<i>Convallaria</i> spp.	Lily of the valley	All countries
<i>Cordyline</i> spp. (leaves)	–	All countries
<i>Craspedia</i> spp.	Craspedia	All countries
<i>Curcuma alismatifolia</i>	Siam tulips	All countries
<i>Cycads</i> (leaves/fronds)	–	All countries
<i>Cyclamen</i> spp.	Persian violet, alpine violet, sowbread	All countries
<i>Delphinium</i> spp.	Delphinium	All countries
<i>Digitalis</i> spp.	Foxglove	All countries
<i>Dracaena</i> spp. (leaves)	–	Indonesia, Malaysia, Mauritius, Singapore and Thailand
<i>Dracaena surculose</i> (leaves)	Dracaena, dragon tree	All countries
<i>Epipremnum aureum</i> and <i>Epipremnum pinnatum</i> (leaves)	Pothos	All countries

continued ...

Table H1 Permitted, non-propagatable fresh cut flowers and foliage species fumigated on arrival continued

Cut flower/foliage species	Common name	Permitted from (specific countries only)
<i>Eustoma grandiflorum</i>	Lisianthus	All countries
<i>Eryngium</i> spp.	Sea holly	All countries
<i>Freesia</i> spp.	Freesia	All countries
<i>Galax urceolata</i>	Wandplant, wandflower, or beetleweed	Singapore
<i>Gentiana triflora</i>	Gentian	All countries
<i>Gerbera</i> spp.	Gerbera	All countries
<i>Gladiolus</i> spp.	Corn flag, sword lily	All countries
<i>Gloriosa</i> spp.	Gloriosa lily, glory lily, climbing lily	All countries
<i>Gypsophila</i> spp.	Baby's breath	All countries
<i>Hippeastrum</i> spp.	Amaryllis, Barbados lily	All countries
<i>Hyacinthus</i> spp.	Hyacinth	All countries
<i>Iris</i> spp.	Iris, flag, fleurdeluce	All countries
<i>Ixia</i> spp.	Corn lily	All countries
<i>Jasminum sambac</i> (flower heads/buds, loose or in garlands)	Arabian jasmine	India, Malaysia and Singapore
<i>Lathyrus odoratus</i>	Sweet pea	All countries
<i>Leucojum</i> spp.	Snowflake	All countries
<i>Liatris</i> spp.	Blazing star, button snake root, gay feather	All countries
<i>Limonium</i> spp.	Statice	All countries
<i>Liriope muscari</i>	Lily turf	Vietnam
<i>Lysimachia clethroides</i>	Loosestrife	All countries
<i>Molucella</i> spp.	Bells of Ireland	All countries
<i>Monstera</i> spp. (leaves)	–	All countries
<i>Muscari</i> spp.	Grape hyacinth	All countries
<i>Narcissus</i> spp.	Daffodil, jonquil	All countries
<i>Nelumbo nucifera</i> (flowers and pods)	Lotus	Thailand
<i>Nerine</i> spp.	Nerine	All countries
<i>Nymphaea</i> spp.	Water lily, water nymph	All countries
<i>Ocimum tenuiflorum</i> (leaves as garlands)	Holy basil	India
<i>Orchidaceae</i>	Orchids	All countries
<i>Ornithogalum</i> spp.	Stars of Bethlehem	All countries
<i>Paeonia</i> spp.	Paeonia, piney flowers	All countries
<i>Arecaceae</i>	Palm fronds (leaves/fronds)	All countries
<i>Pandanus odoratissimus</i> (fruit)	–	Tonga
<i>Papaver</i> spp.	Poppy flowers	All countries
<i>Philodendron</i> spp. (leaves)	–	All countries
<i>Phormium</i> spp. (leaves/fronds)	New Zealand flax	All countries

continued ...

Table H1 Permitted, non-propagatable fresh cut flowers and foliage species fumigated on arrival continued

Cut flower/foliage species	Common name	Permitted from (specific countries only)
<i>Polianthes</i> spp.	Tuberose	All countries
<i>Primula</i> spp.	Primrose	All countries
<i>Pteridopsida</i> – all fern species (except for <i>Asplenium</i> spp other than <i>Asplenium nidus</i>) (leaves and fronds)	Ferns	All countries (except <i>Adiantum</i> sp., which is not permitted from Canada, United States and European countries)
<i>Ranunculus asiaticus</i>	Persian buttercup, florist ranunculus	All countries
<i>Sandersonia</i> spp.	Chinese lantern lily	All countries
<i>Scabiosa</i> spp.	Morning bride	All countries
<i>Strelitzia</i> spp.	Bird of paradise	All countries
<i>Symphotrichum ericoides</i>	White aster, formerly <i>Aster ericoides</i>	All countries
<i>Tagetes</i> spp.	Marigold	All countries
<i>Thalictrum</i> spp.	Meadow rue flowers	All countries
<i>Triteleia</i> spp.	Spring star flowers	All countries
<i>Trollius</i> spp.	Globe flowers	All countries
<i>Tropaeolum</i> spp.	Nasturtium	All countries
<i>Tulipa</i> spp.	Tulip	All countries
<i>Zantedeschia</i> spp.	Calla lily	All countries
<i>Zinnia</i> spp.	Zinnia	All countries

Source: Import conditions database, Australian Government Department of Agriculture, Canberra

Appendix I: Standard procedure for cargo terminal operator verification and inspection of imported fresh cut flower and foliage consignments

1. The exporter sends the importer a copy of the airway bill, commercial invoice, government-to-government certification (phytosanitary and devitalisation certificates) and packing list.
2. Once the cargo has been reported by the airline, the importer/agent (customs broker) creates a declaration in the Australian Customs and Border Protection's (Customs) Integrated Cargo System (ICS). This declaration is used by Customs and the Australian Government Department of Agriculture and is allocated a unique alphanumeric entry number that can be used to electronically manage the shipment at the border.
3. In the ICS, the importer/agent declares what tariff the product is being imported under, which allows the department to profile commodities that are or could be of biosecurity risk. If the shipment is profiled, the ICS forwards the import information to the department's Australian Import Management System (AIMS) database. AIMS enables the department to hold and manage the shipment for quarantine purposes.
4. Before shipment arrives, the importer/agent contacts the department, provides department staff with appropriate documentation (either paper copies presented in person at the front counter or scanned copies sent electronically) and requests a booking for border clearance and inspection of the imported consignment by the department.
5. In the South East Region, the Client Contact Group (similar systems in other regions) manages the booking of cargo terminal operator (CTO) verification and inspection times using an in-house electronic database.
6. Border clearance involves CTO verification of integrity of packaging for movement, followed by inspection at a quarantine approved premises. Inspectors examine randomly drawn samples of imported consignments for presence of any live insect pests, disease symptoms or other quarantine risk material.
7. A department officer reviews documentation to ensure compliance with import requirements. If any deficiency is noted in the documentation, the officer requests additional information or clarification from the importer/agent. At this stage, the importer may contact the exporter for further information.
8. As ICS and AIMS are linked, the unique entry number allocated in step (b) is used to manage the consignment through the border quarantine process. AIMS is updated at various points to reflect directions imposed and decisions taken before the consignment is released from quarantine. The importer/agent is also able to track movement of the consignment in AIMS using the airway bill number or entry number.
9. On the appointed day, if all biosecurity documentary assessment has been appropriately completed, a department officer travels to airline bond to perform CTO verification of imported consignments. Staff verify the original phytosanitary certificate(s), ensure

- integrity of packaging, draw the appropriate number of cartons of fresh cut flowers and/or foliage as representative samples and seal cartons using the department seal.
10. Following CTO verification, staff issue a movement directions to inspection premises document to the importer/agent, enabling the importer/agent to transport the consignment to the designated inspection premises. Inspection occurs either at the department's regional office or a third-party Class 2.4 quarantine approved premises (QAP).
 11. The importer/agent presents the movement directions to inspection premises document to the CTO representative.
 12. The CTO representative verifies the status of the consignment in the ICS and releases the consignment to the importer/agent, who then arranges for movement to the department's designated inspection area. The CTO representative also updates the ICS, noting release of the consignment from airline bond/cargo terminal.
 13. The department officer makes comments in AIMS, and adds the goods movement directions document.
 14. The importer/agent transports and presents the sealed samples (cartons of fresh cut flowers) and relevant documentation to staff at the department's designated inspection premises. Staff confirm the seal numbers are consistent with those noted on the original movement direction. They then cut the seal and the importer/agent is allowed to help verify the contents of the consignment.
 15. Inspection at a Class 2.4 QAP encompasses checking:
 - phytosanitary certificate and devitalisation certificate, noting fumigation and/or devitalisation exemptions
 - invoices/labels specify permitted cut flowers only
 - the cartons of cut flowers match the label and invoices
 - that the consignment does not contain more produce than documented and no cartons are missing.
 16. Staff typically examine 90 per cent of flowers from the sample under a magnifying lamp (at magnification 3×) for signs of infection/infestation. After shaking the flower bunches, the sweepings are collected for inspection under a magnifying lamp (10×). Staff also inspect 10 per cent of stems from the sample for sap-sucking insects, such as thrips and mealy bugs, using high power magnification (10×). Furthermore, staff check for insect pests on the underside of leaves/foilage, and on flower heads (especially petals and sepals). It may be necessary to use destructive sampling methods on some flowers.
 17. If insect pests or diseases are detected, staff complete the pest and disease interception form or create an entry in the 'incidents' field in AIMS and collect and forward specimens to the Operational Science Programme for identification and treatment options.
 18. Where no fumigation exemptions apply or if live insects are found, staff order the consignment for fumigation with methyl bromide at the importer's nominated premises and record this in AIMS—unless the importer/broker nominates to hold the consignment pending identification.

19. If the consignment is propagatable and not accompanied by certification as having been devitalised, the staff direct the consignment for devitalisation onshore.
20. If prohibited cut flower species are found, the importer is given the option to export or destroy.
21. If permitted flowers that are not listed on accompanying documents are identified during inspection, the contents of all cartons in the consignment should be verified.
22. Consignments found to contain snails or slugs must be re-inspected after fumigation. If live snails are found during re-inspection, the consignment should be re-fumigated or held and re-inspected 24 hours after fumigation.
23. The tolerance level is one to two weed seeds per consignment of cut flowers. If seed exceeds the tolerance level, consignments should be held while contaminant seed is identified. If contaminant seed is identified and it is not a weed species, no action is required.
24. The department officer updates the quarantine entry in AIMS, adding goods/seal verification and inspection outcomes as comments.
25. If accompanying documentation meets all requirements and passes the verification inspection (no live insect pests or signs of diseases are found), the department issues a release from quarantine notice.
26. Where a consignment fails verification inspection or where the department's quarantine requirements cannot be fulfilled, the department issues an order into quarantine notice. If the importer confirms that they do not wish to re-export such a consignment, the department issues a seizure notice for a consignment that does not meet Australia's import conditions. At this stage, the consignment may be referred to department's Central Office.
27. The Director of Quarantine (or delegate) may issue a certificate of equivalence to allow the consignment to be released from quarantine if an alternate condition can be met that manages the biosecurity risk equivalent to the condition listed on the department's import conditions database.
28. Consignments not re-exported are treated as quarantine waste and dealt with by the department for safe destruction. The cost of destruction is borne by the importer.

Maps, figures and tables

Map 1 Biosecurity regional boundaries, Australia



Northern includes Torres Strait and south to Cardwell, Northern Territory, west to Broome and the Indian Ocean territories.

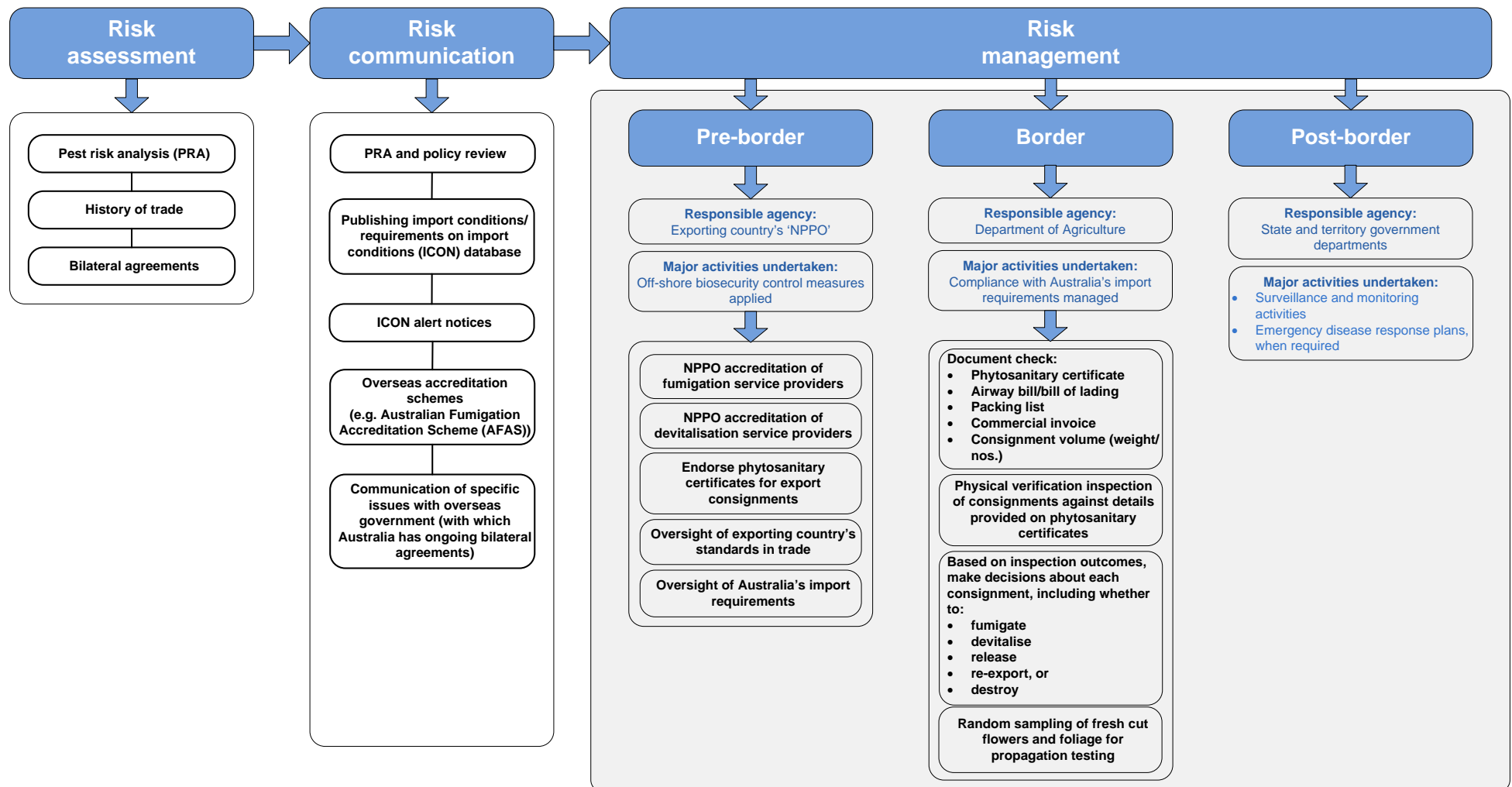
South West from south of Broome, includes South Australia (including Broken Hill – excluding Riverland).

South East includes Tasmania, Riverland and extends north to Riverina and east coast NSW to Eden.

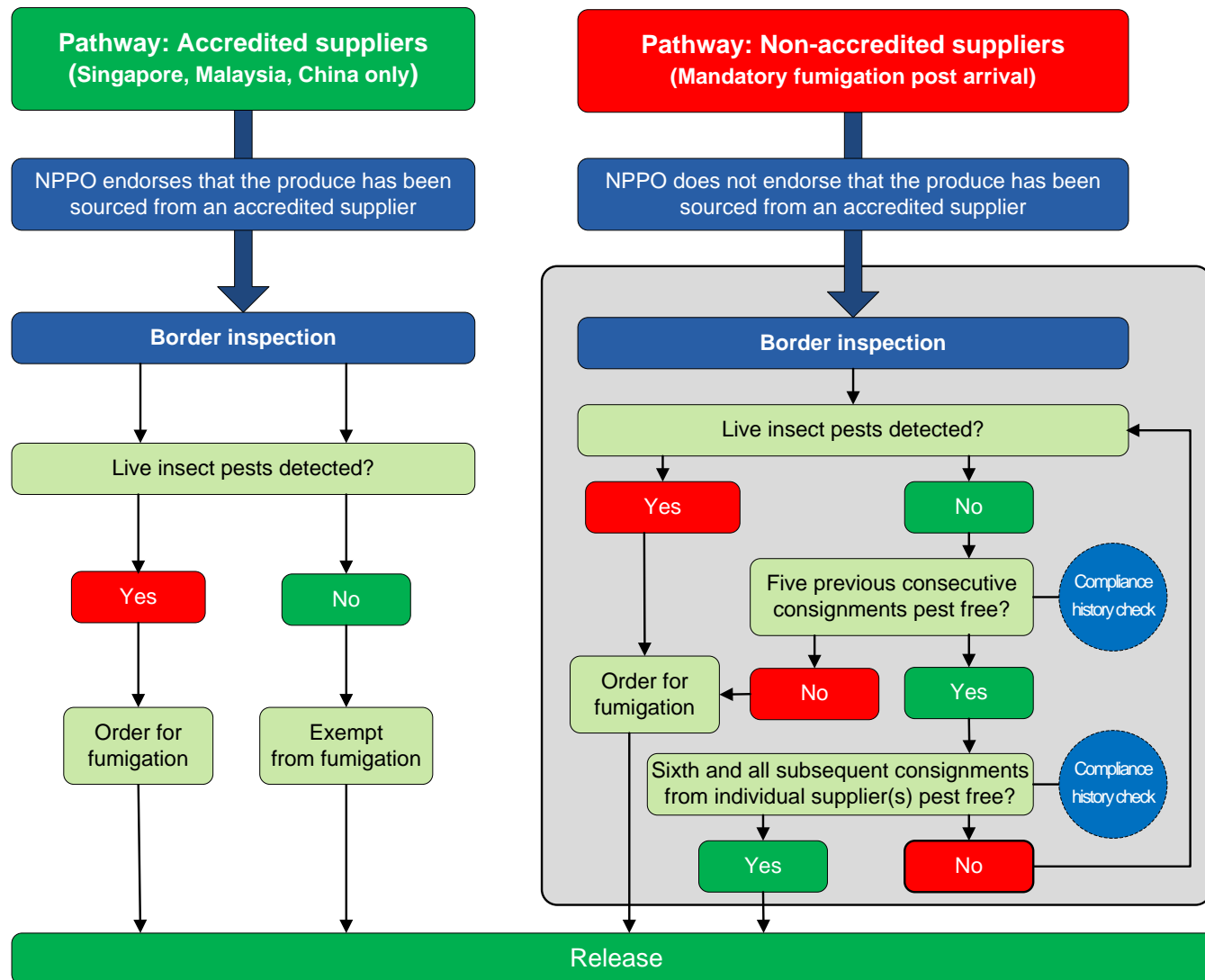
Central East includes NSW with the exception of Eden and areas south, Riverina and far north coast.

North East extends from Cardwell to far north coast NSW, south to Grafton.

Source: Australian Government Department of Agriculture, Canberra

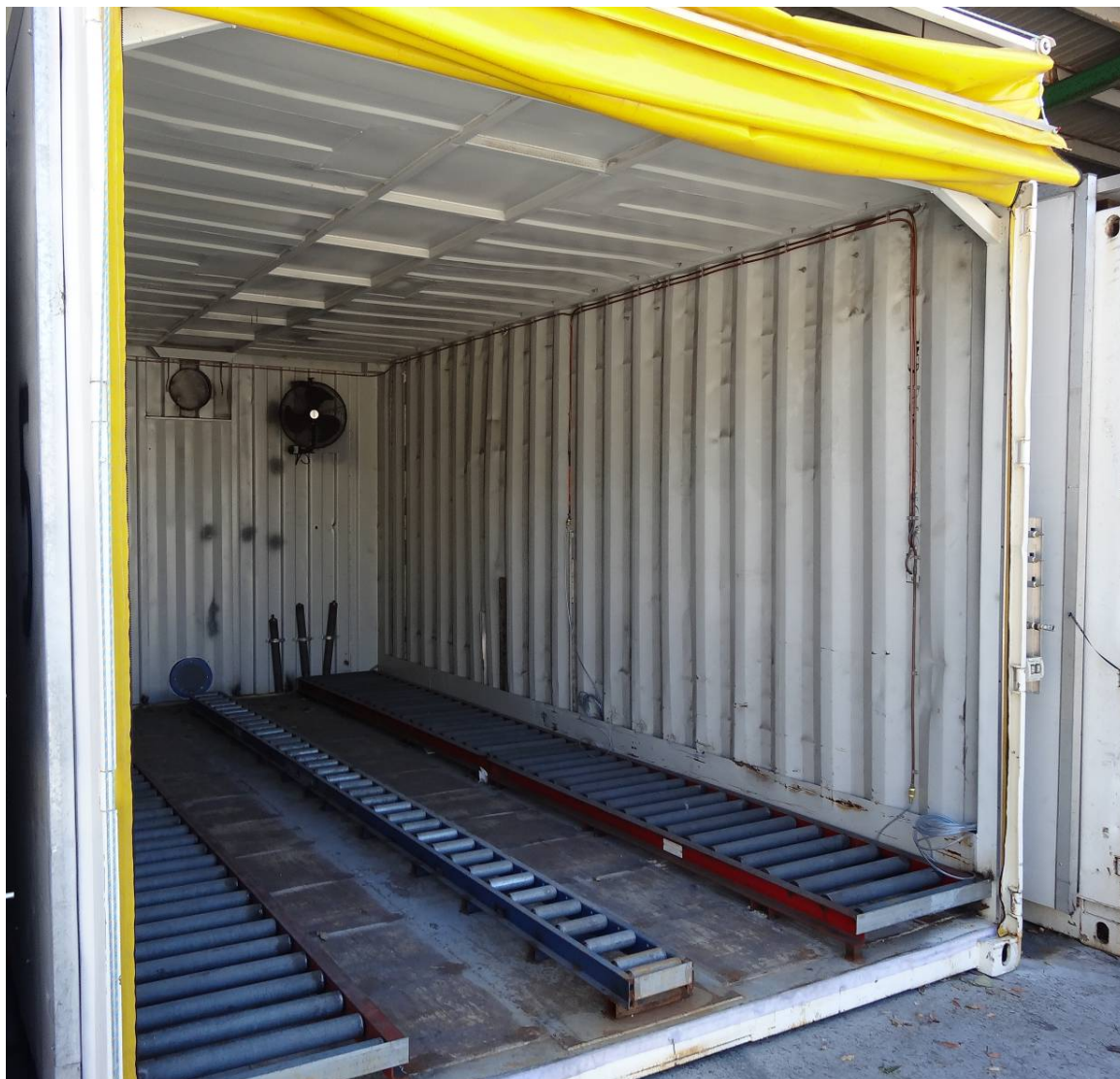
Figure 1 Department of Agriculture, control measures for fresh cut flowers and foliage imported into Australia

NPPO National Plant Protection Organisation in each exporting country.
 Source: Interim Inspector-General of Biosecurity, Canberra

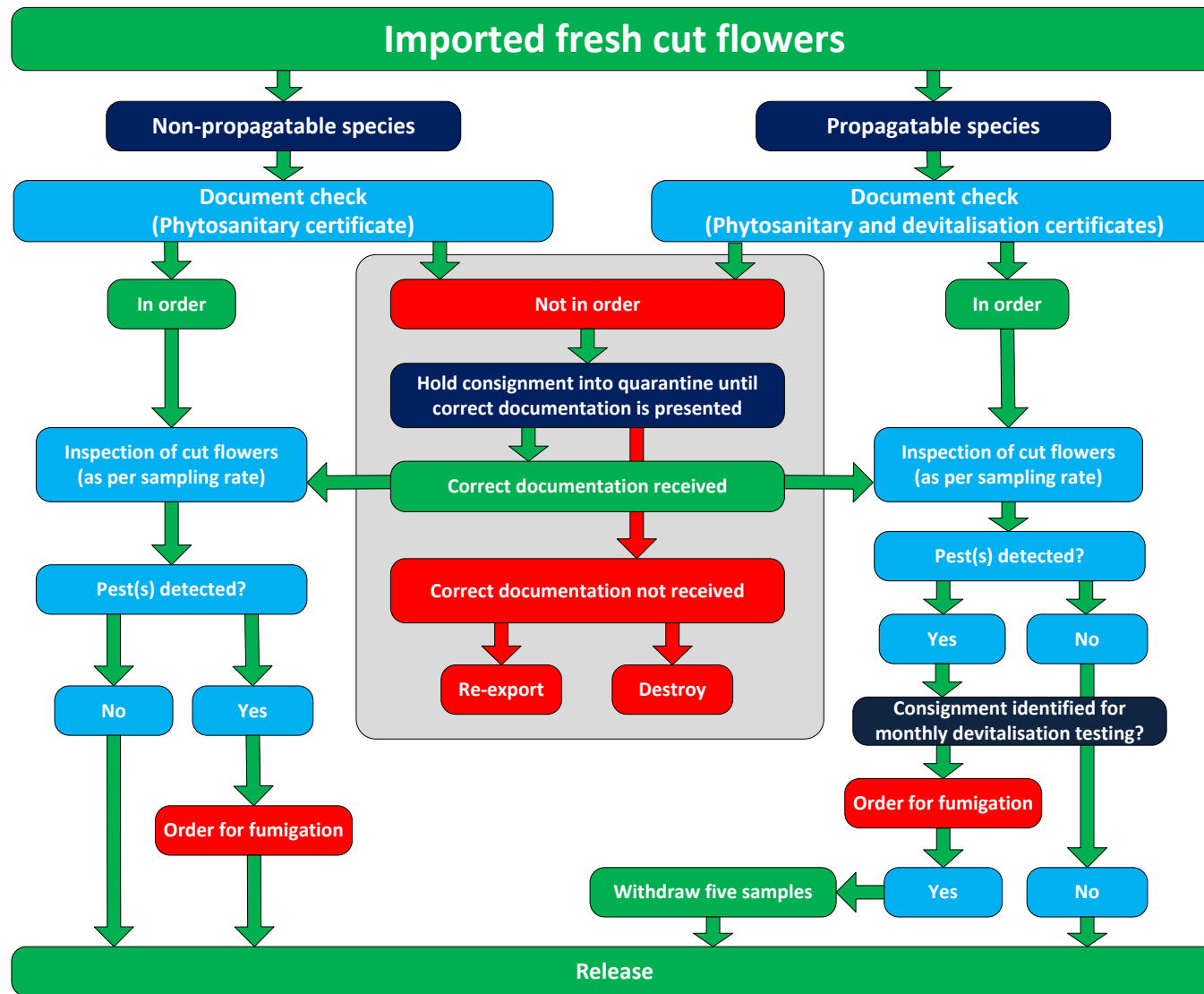
Figure 2 Determining fumigation requirements for commercial fresh cut flowers and foliage imported into Australia

Source: Interim Inspector-General of Biosecurity, Canberra

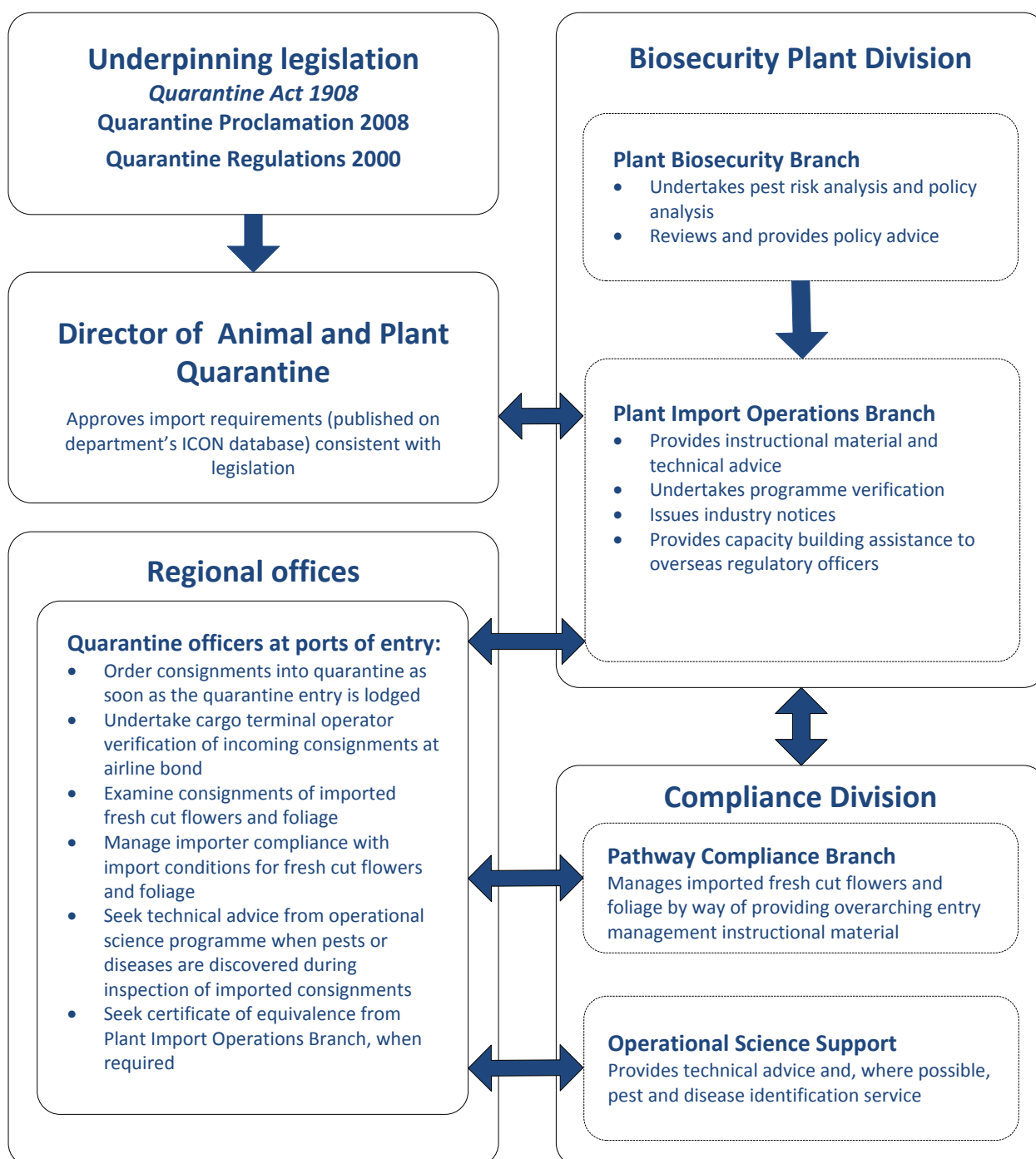
Figure 3 Typical fumigation chamber used by third-party quarantine approved premises



Note: Shows modified shipping container, with gas sensors for monitoring fumigation of imported cut flowers.
Source: Interim Inspector-General of Biosecurity, Canberra

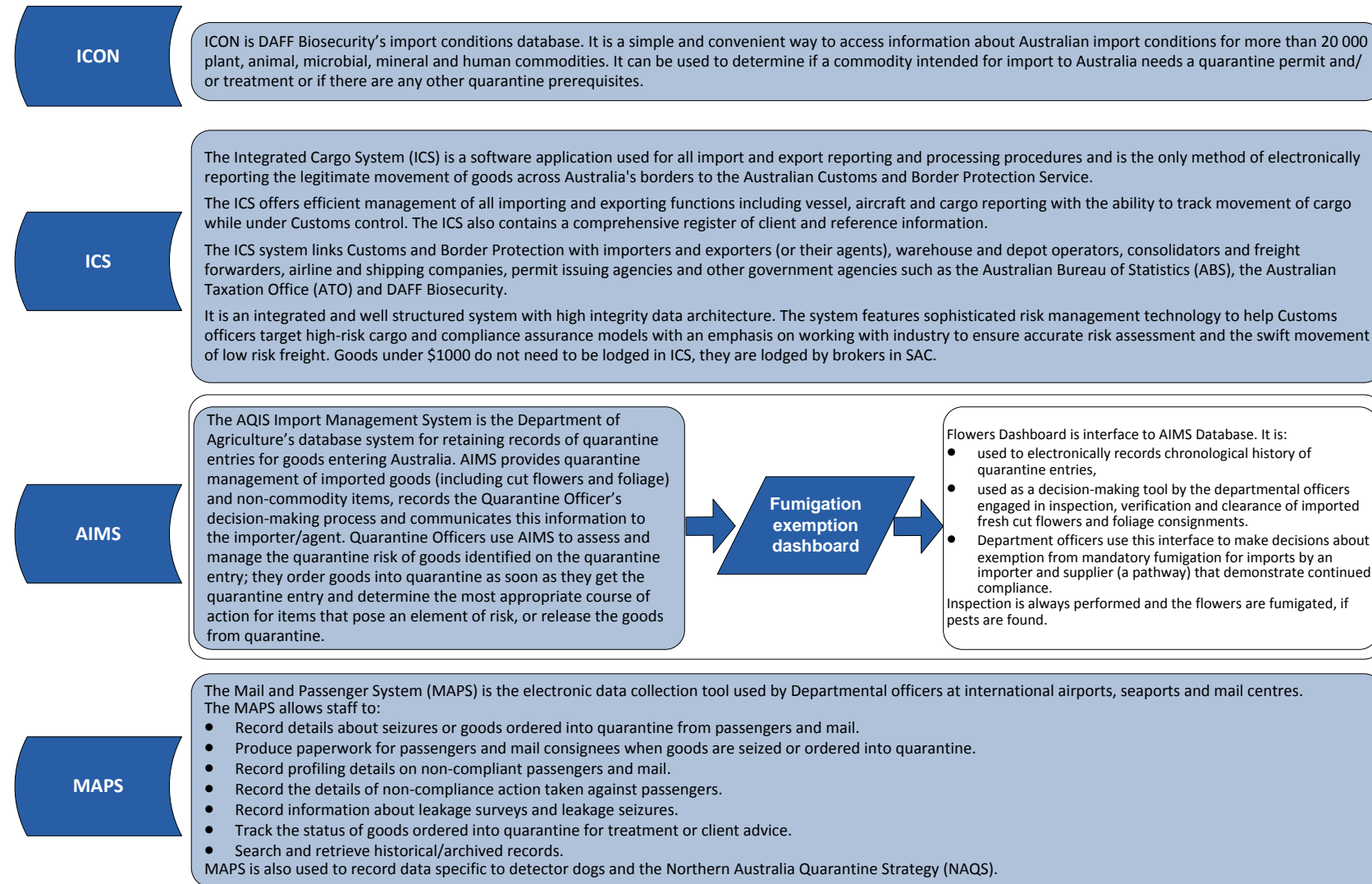
Figure 4 Determining devitalisation requirements for commercial fresh cut flowers and foliage imported into Australia

Source: Interim Inspector-General of Biosecurity, Canberra

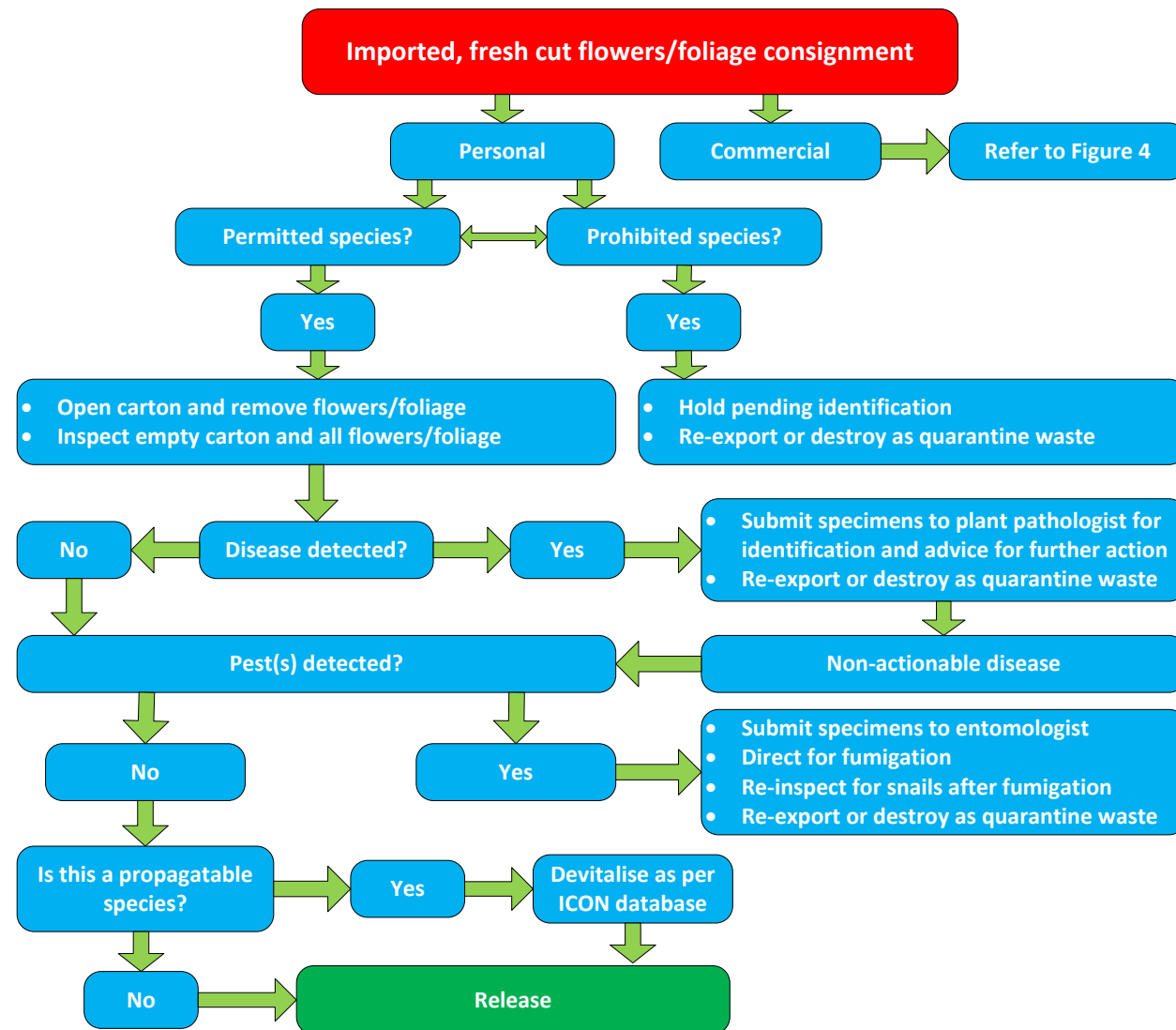
Figure 5 Department of Agriculture, international, national and regional roles and responsibilities

Source: Interim Inspector-General of Biosecurity, Canberra

Figure 6 Databases used by Department of Agriculture to lodge and record movement, inspection findings and release of cut flowers and foliage imported into Australia



Source: Interim Inspector-General of Biosecurity, Canberra

Figure 7 Inspection of personal consignments of fresh cut flowers and foliage imported into Australia

Source: Interim Inspector-General of Biosecurity, Canberra

Figure 8 Non-integral cartons in a flower consignment imported into Australia



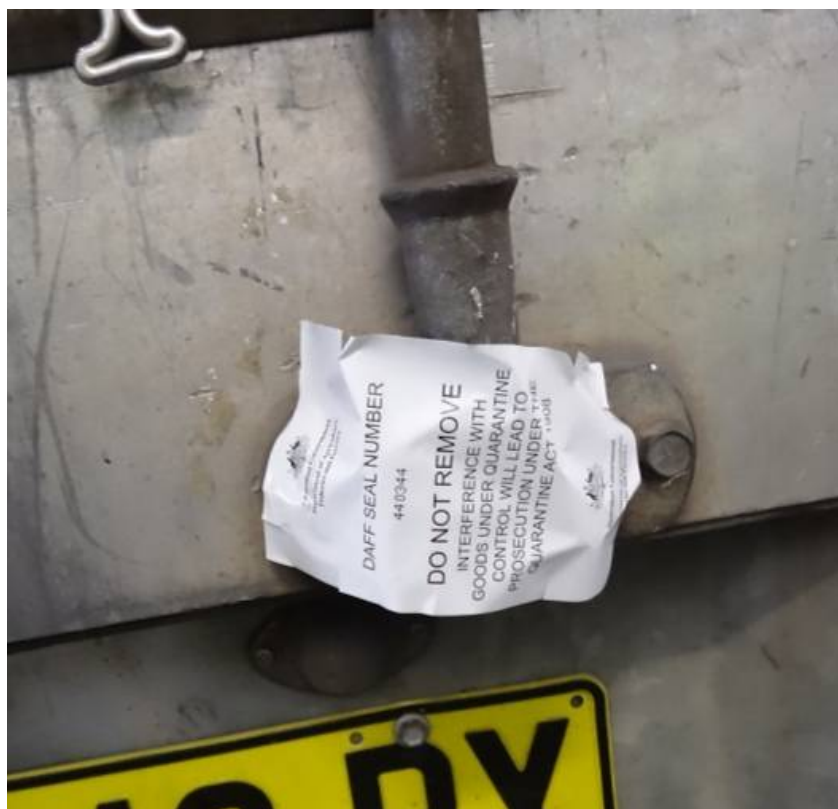
Source: Interim Inspector-General of Biosecurity, Canberra

Figure 9 Quarantine seals used by the Department of Agriculture

a. Plastic tamper-proof seal



b. Unsatisfactory adhesive paper seal



Source: Interim Inspector-General of Biosecurity, Canberra

Figure 10 Roses undergoing devitalisation treatment in Kenya, for export to Australia



Source: Interim Inspector-General of Biosecurity, Canberra

Figure 11 Bunches of roses, showing individual identification, Kenya



Source: Interim Inspector-General of Biosecurity, Canberra

Figure 12 Typical one-hectare greenhouse, Kenya



Note: Hydroponic beds being prepared and equipped with irrigation pipes. Roof can be mechanically opened or closed.
Source: Interim Inspector-General of Biosecurity, Canberra

Figure 13 Packing facility at a large flower farm, Kenya



Source: Interim Inspector-General of Biosecurity, Canberra

Figure 14 Harvesting predatory mites, Kenya



Note: Harvesting beneficial mites from a companion crop as part of an integrated pest management programme. Attracted by light, the mites crawl upwards along sisal fibres and into the collection jar at the top.
Source: Interim Inspector-General of Biosecurity, Canberra

Figure 15 Pre-export inspection of roses by a Kenya Plant Health Inspectorate Service officer



Source: Interim Inspector-General of Biosecurity, Canberra

Figure 16 Kenya Plant Health Inspectorate Service head office, Nairobi



KEPHIS headquarters: Dr Esther Kimani, General Manager Phytosanitary Services, and Dr Mary Githingi, Senior Inspector Phytosanitary Services, with Dr Michael Bond, IIGB.

Table 1 Import volumes of selected cut flower and foliage species, 2008–12

Year	Commodity description	Bottle	Box	Carton	Gram	Kilo	No.	Piece	Package	Unit
2008	Chrysanthemums	–	–	–	–	–	432 940	–	–	–
	Cut flowers and flower buds of a kind suitable for bouquets or for ornamental purposes, fresh, dried, dyed, bleached, impregnated or otherwise prepared	–	–	–	–	250	–	1 000	–	–
	Fresh foliage	–	–	–	–	–	858 161	–	–	14
	Orchids	–	–	–	–	–	5 165 584	–	–	–
	Other a	–	–	–	–	–	1 073 355	–	–	22
	Roses	–	–	–	–	–	4 161 318	–	–	–
	<i>Total</i>	–	–	–	–	250	11 691 358	1 000	–	36
2009	Carnations	–	–	–	–	–	20	–	–	–
	Chrysanthemums	–	–	–	–	–	3 260 765	–	–	–
	Cut flowers and flower buds of a kind suitable for bouquets or for ornamental purposes, fresh, dried, dyed, bleached, impregnated or otherwise prepared	–	–	2	–	6 418	–	2 260	–	–
	Foliage, branches and other parts of plants, without flowers or flower buds, and grasses, mosses and lichens, being goods of a kind suitable for bouquets or for ornamental purposes, fresh, dried, dyed, bleached, impregnated or otherwise prepared	–	–	–	–	1	–	–	367	–
	Fresh foliage	–	–	–	–	–	5 079 481	–	–	13
	Orchids	–	–	–	–	1 101	20 453 287	–	–	–
	Other a	–	–	–	–	–	3 942 422	–	–	58
	Roses	–	–	–	–	–	28 513 665	–	–	–
	<i>Total</i>	–	–	2	–	7520	61 249 640	2 260	367	71

continued ...

Table 1 Import volumes of selected cut flower and foliage species, 2008–12 continued

Year	Commodity description	Bottle	Box	Carton	Gram	Kilo	No.	Piece	Package	Unit
2010	Chrysanthemums	–	–	–	–	–	3 820 905	–	–	–
	Cut flowers and flower buds of a kind suitable for bouquets or for ornamental purposes, fresh, dried, dyed, bleached, impregnated or otherwise prepared	–	–	–	–	32	–	6	–	10
	Foliage, branches and other parts of plants, without flowers or flower buds, and grasses, mosses and lichens, being goods of a kind suitable for bouquets or for ornamental purposes, fresh, dried, dyed, bleached, impregnated or otherwise prepared	–	1	–	–	0.4	–	–	–	–
	Fresh foliage	–	–	–	–	–	8 241 985	–	–	5
	Orchids	–	–	–	–	–	20 722 816	–	–	–
	Other a	–	–	–	–	–	3 440 344	–	–	25
	Roses	–	–	–	–	–	35 846 919	–	–	–
	<i>Total</i>	–	1	–	–	32	72 072 969	6	–	40
2011	Carnations	–	–	–	–	–	80 568	–	–	–
	Chrysanthemums	–	–	–	–	–	1 583 443	–	–	–
	Cut flowers and flower buds of a kind suitable for bouquets or for ornamental purposes, fresh, dried, dyed, bleached, impregnated or otherwise prepared	–	–	–	–	8 168	–	–	–	–
	Foliage, branches and other parts of plants, without flowers or flower buds, and grasses, mosses and lichens, being goods of a kind suitable for bouquets or for ornamental purposes, fresh, dried, dyed, bleached, impregnated or otherwise prepared	–	–	–	790	303	2	348	132	–
	Fresh foliage	–	–	–	–	–	9 451 372	–	–	9
	Orchids	–	–	–	–	–	24 533 016	–	–	–
	Other a	–	–	–	–	–	6 506 697	–	–	27
	Roses	–	–	–	–	–	50 222 653	–	–	–
	<i>Total</i>	–	–	–	790	8 471	92 377 750	348	132	36

continued ...

Table 1 Import volumes of selected cut flower and foliage species, 2008–12 continued

Year	Commodity description	Bottle	Box	Carton	Gram	Kilo	No.	Piece	Package	Unit
2012	Carnations	–	–	–	–	–	822 019	–	–	–
	Chrysanthemums	–	–	–	–	–	334 310	–	–	–
	Cut flowers and flower buds of a kind suitable for bouquets or for ornamental purposes, fresh, dried, dyed, bleached, impregnated or otherwise prepared	–	2	–	–	87	–	–	–	–
	Foliage, branches and other parts of plants, without flowers or flower buds, and grasses, mosses and lichens, being goods of a kind suitable for bouquets or for ornamental purposes, fresh, dried, dyed, bleached, impregnated or otherwise prepared	15	–	–	–	10	–	14	–	81
	Fresh foliage	–	–	–	–	–	6 145 57	–	–	27
	Lillies (<i>Lilium</i> spp.)	–	–	–	–	–	19 751	–	–	–
	Orchids	–	–	–	–	–	25 767 427	–	–	–
	Other a	–	–	–	–	–	8 923 018	–	–	27
	Roses	–	–	–	–	–	78 315 653	–	–	–
	<i>Total</i>	15	2	–	–	97	120 327 752	14	–	135

a Other relates to the tariff description and is generally used when none of the specific tariff descriptions apply (for example, specific tariff codes do not exist for roses, orchids or chrysanthemums) and could therefore be any of the permitted flower species that do not have a specific tariff code/description.

Source: Australian Government Department of Agriculture, Canberra

Table 2 Countries approved by Department of Agriculture to perform offshore devitalisation

Approved countries

China
Colombia
Ecuador
Ethiopia
India
Israel
Kenya
Malaysia
Mexico
New Zealand
Netherlands
Singapore
South Africa
South Korea
Sri Lanka
Tanzania
Vietnam
Zimbabwe

Source: Import conditions database, Australian Government Department of Agriculture, Canberra

Table 3 Rate of sampling of fresh cut flowers imported into Australia

Minimum no. sampled	1 supplier	2 to 3 suppliers	4 to 5 suppliers
Cartons	6	8	10
Stems per carton	100	80	60

Source: Instruction and guideline: imported cut flower clearance, Australian Government Department of Agriculture, Fisheries and Forestry, Canberra (internal document, DAFF 2013b)

Glossary

additional declaration	Endorsement required on the phytosanitary certificate for each consignment—must include a statement from the country or region of origin to show how the consignment complies with import conditions
airway bill	Contract between the shipper and airline that states the terms and conditions of transportation; serves as receipt from the airline to prove the goods were received
audit	Systematic, independent and documented process for obtaining evidence and evaluating it objectively to determine the extent to which criteria are fulfilled; includes a desk assessment of documentary material and, where necessary, on-site verification through an examination of the systems in place
biosecurity	The management of the risks to the economy, the environment, and the community, of pests and diseases entering, emerging, establishing or spreading
consignment	Total quantity of imported fresh cut flowers arriving at the same time in one or more lots, nominated on a single quarantine entry covered by each phytosanitary certificate
cut flower	Floral parts of a plant supported on a vegetative shoot; refers to both flowers and foliage
destructive sampling method	The action of destroying a unit (flower or foliage) to determine whether the presence of pests or diseases that cannot otherwise be detected; renders the unit unsaleable
devitalisation	Chemical treatment (dipping) process that renders live plant material non-viable; inhibits or prevents propagation of flowers, thereby reducing the risk of transmission and spread of diseases of biosecurity concern
fibrillation	Action of shaking single blooms and bunches of blooms in an attempt to dislodge any insects that may be present
fumigation exemption dashboard	Interface that uses inspection results to determine when an import pathway has a history of meeting import conditions (for the most part free from pests and diseases); pathways that are compliant may be exempt from fumigation
integral packaging	Packaging that does not enable pests to easily escape from the product; for fresh flowers this may include:

	<ol style="list-style-type: none"> 1. sealed cartons without ventilation holes 2. vented cartons with sealed holes must have holes sealed with plastic or mesh (pore size maximum 1.6 millimetres) 3. sealed plastic liners placed inside vented cartons
IPPC	The International Plant Protection Convention, a multilateral treaty administered by the Food and Agriculture Organization of the United Nations (FAO), aims to secure coordinated, effective action to prevent and control the introduction and spread of pests of plants and plant products; the IPPC is recognised by the World Trade Organization's Agreement on the Application of Sanitary and Phytosanitary Measures as the only international standard setting body for plant health.
ISPM	International Standards for Phytosanitary Measures
NPPO	National Plant Protection Organisation
overseas accreditation scheme	Agreed scheme between Australia and overseas government authorities that includes phytosanitary certification of all consignments
phytosanitary certificate	Document issued by the government of an exporting country to the government of the importing country, testifying that a plant destined for export is free from quarantine risk material including pests, diseases and weed seeds; Phytosanitary certificates are mandatory where overseas authorities verify the devitalisation of a product, where flowers are sourced through accreditation schemes or where specific treatments have been applied offshore
propagatable	Plant material that will grow, including seed, bulbils or stem cuttings
treatment certificate	Document issued by the overseas treatment facility for treatments performed on imported cut flowers approved for exemption from mandatory fumigation or pre-shipment devitalisation

References

ANAO 2001, *Managing for quarantine effectiveness*, audit report no. 47, 2000–01, Australian National Audit Office, Canberra, available at anao.gov.au/Publications/Audit-Reports/2000-2001/Managing-for-Quarantine-Effectiveness.

Australian Parliament, Senate 2013, 'Budget estimates 2013–14: answers to questions on notice', Senate Rural and Regional Affairs and Transport Legislation Committee, question on notice no. 89, available at aph.gov.au/Parliamentary_Business/Senate_Estimates/rtratctte/estimates/bud1314/daff/index.

Australian Customs Service 2014, *Underbond movements (air cargo)—a quick guide*, available at cargosupport.gov.au/site/documents/QRG_Air_Underbond_Movement_.pdf (pdf 125kb).

Beale, R, Fairbrother, J, Inglis, A & Trebeck, D 2008, *One biosecurity: a working partnership*, Commonwealth of Australia, Canberra, available at daff.gov.au/about/publications/quarantine-biosecurity-report-and-preliminary-response.

Carnegie, AJ & Lidbetter JR 2012, 'Rapidly expanding host range for *Puccinia psidii* sensu lato in Australia', *Australasian Plant Pathology*, vol. 41, no. 1, pp. 13–29, available at link.springer.com/article/10.1007%2Fs13313-011-0082-6#.

Commonwealth of Australia (2006). Contingency planning for eucalyptus rust. Records and Resolutions of the Primary Industries Ministerial Council (20 April 2006), 100–104.

DAFF 2013, 'Changes to imported cut flower fumigation requirements', *Notice to industry 19–2013*, Department of Agriculture, Fisheries and Forestry, Canberra, available at daff.gov.au/biosecurity/import/general-info/ian/13/19-2013.

— 2012a, *Biosecurity Compliance Strategy: A plan for managing compliance and enforcement in Australia*, Department of Agriculture, Fisheries and Forestry, Canberra, available at daff.gov.au/biosecurity/about/biosecurity-compliance-strategy.

— 2012b, *Imported cut flower treatment guide*, Department of Agriculture, Fisheries and Forestry, Canberra, available at daff.gov.au/biosecurity/import/plant-products/information-about-importing-cut-flowers-and-foliage/general-requirements-commercial-fresh-cut-flower-foliage-imports.

— 2012c, *Minimum document requirements policy*, Department of Agriculture, Fisheries and Forestry, Canberra, available at daff.gov.au/biosecurity/import/general-info/documentary-requirements/minimum-document-requirements-policy.

— 2012d, 'Pilot of automated fumigation exemptions for cut flowers', *Notice to industry 97–2012*, Department of Agriculture, Fisheries and Forestry, Canberra, available at <http://www.daff.gov.au/biosecurity/import/general-info/ian/12>.

— 2011a, *Import risk analysis handbook*, Department of Agriculture, Fisheries and Forestry, Canberra, available at daff.gov.au/ba/ira/process-handbook.

— 2011b, *Update on response to myrtle rust*, Communiqué, 8 March 2011, Department of Agriculture, Fisheries and Forestry, Canberra.

Department of Agriculture 2014a, The Australian Fumigation Accreditation Scheme (AFAS) methyl bromide fumigation standard, Department of Agriculture, Canberra, available at <http://www.agriculture.gov.au/SiteCollectionDocuments/biosecurity/import/general-info/qtfp/standard2.2.pdf>.

— 2014b, Methyl bromide—questions and answers, Department of Agriculture, Canberra, available at <http://www.daff.gov.au/biosecurity/import/general-info/pre-border/afas/methyl-bromide-questions-and-answers>.

— 2013, *Final policy review: alternative risk management measures to import liliun spp. cut flowers from Taiwan*, Department of Agriculture, Canberra, available at [daff.gov.au/ba/reviews/final-plant/liliun spp. cut flowers from taiwan/ba2013-24-final-policy-review-liliun-spp-taiwan](http://daff.gov.au/ba/reviews/final-plant/liliun_spp._cut_flowers_from_taiwan/ba2013-24-final-policy-review-liliun-spp-taiwan).

FAO 2013, '2013 September IPPC call for experts', International Plant Protection Convention, Food and Agriculture Organization of the United Nations, Rome, available at ippc.int/core-activities/standards-setting/calls/calls-for-experts/2013-september-ippc-call-for-experts.

FAO 2007, *International Standards for Phytosanitary Measures: Framework for pest risk analysis*, ISPM no. 2, Secretariat of the International Plant Protection Convention, Food and Agriculture Organization, Rome, available at agriculture.gouv.fr/IMG/pdf/ispm02_versionang_2007.pdf (pdf 132kb).

FAO 2005, *International Standards for Phytosanitary Measures: Guidelines for phytosanitary certificates*, ISPM no. 12, Secretariat of the International Plant Protection Convention, Food and Agriculture Organization of the United Nations, Rome, available at fao.org/docrep/009/a0450e/a0450e00.htm.

FAO 2004, *International Standards for Phytosanitary Measures: Pest risk analysis for quarantine pests, including analysis of environmental risks and living modified organisms*, ISPM no. 11, Secretariat of the International Plant Protection Convention, Food and Agriculture Organization of the United Nations, Rome, available at fao.org/docrep/008/y5874e/y5874e00.htm.

Fazier, M, Muli, E, Conklin, T, Schmehl, D, Torto, B, Frazier, J, Tumlinson, J, Evans, J & Raina, S 2010, A scientific note on *Varroa destructor* found in East Africa; threat or opportunity?', *Apidologie*, July, vol. 41, no. 4, pp. 463–65, available at link.springer.com/article/10.1051%2Fapido%2F2009073.

Flower Association of Queensland 2014, 'Import and export', Flower Association of Queensland Inc., Cleveland, Queensland, australianflowerindustry.com.au/industry/importexport.

Invasive Species Council 2011, *Environmental impacts of myrtle rust—fact sheet*, Invasive Species Council, Fairfield, Victoria, available at invasives.org.au/publications/environmental-impacts-myrtle-rust.

Plant Health Australia 2011, *Industry biosecurity plan for the nursery and garden industry: Threat specific contingency plan—Thrips transmitted viruses*, Plant Health Australia, Canberra, available at planthealthaustralia.com.au/wp-content/uploads/2013/03/Thrips-transmitted-viruses-CP-2011.pdf (pdf 1.16mb).

Internal documents

DAFF 2013a, *Instruction and guideline: creating and maintaining profiles in the integrated cargo system (ICS)*, Department of Agriculture, Fisheries and Forestry, Canberra.

— 2013b, *Instruction and guideline: imported cut flower clearance*, Department of Agriculture, Fisheries and Forestry, Canberra.

— 2013c, *Instruction and guideline: movement protocol for live/viable quarantinable material for OSP analysis*, Department of Agriculture, Fisheries and Forestry, Canberra.

— 2012a, *Guideline: Guide to re-conditioning of fresh produce consignments including cut flowers and foliage*, Department of Agriculture, Fisheries and Forestry, Canberra.

— 2012b, *Instruction and guideline: cut flower devitalisation and audit*, Department of Agriculture, Fisheries and Forestry, Canberra.

— 2012c, *National Policy - CTO Verifications for Air-freight Perishables*, Department of Agriculture, Fisheries and Forestry, Canberra.

— 2012d *Work instruction: cut flowers and foliage inspections for non-commercial consignments and for personal consignments at Australian international airports*, Department of Agriculture, Fisheries and Forestry, Canberra.

— 2011, *Work Instruction: methyl bromide fumigations: supervision and monitoring*, Department of Agriculture, Fisheries and Forestry, Canberra.