



National
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Developing a Plant Health Standard for the National Trust's Parks and Gardens

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‘The gardens and parks of the National Trust safeguard the world’s largest collection of cultivated plants.’

Roy Lancaster 2005



Stats...

- 200+ gardens and parks
- Over 500,000 recorded plants
- 30,000 taxa (species, sub-species, hybrids, cultivars etc, etc)
- 22 National Plant Collections



Where are these plants?

- Gardens
- Parks
- Arboretums
- Ornamental and historical landscapes
- Forest 'Gardens'

The variety of places is reflected by the variety of plants...



Sitka spruce at
Aira Force



Small indoor collections



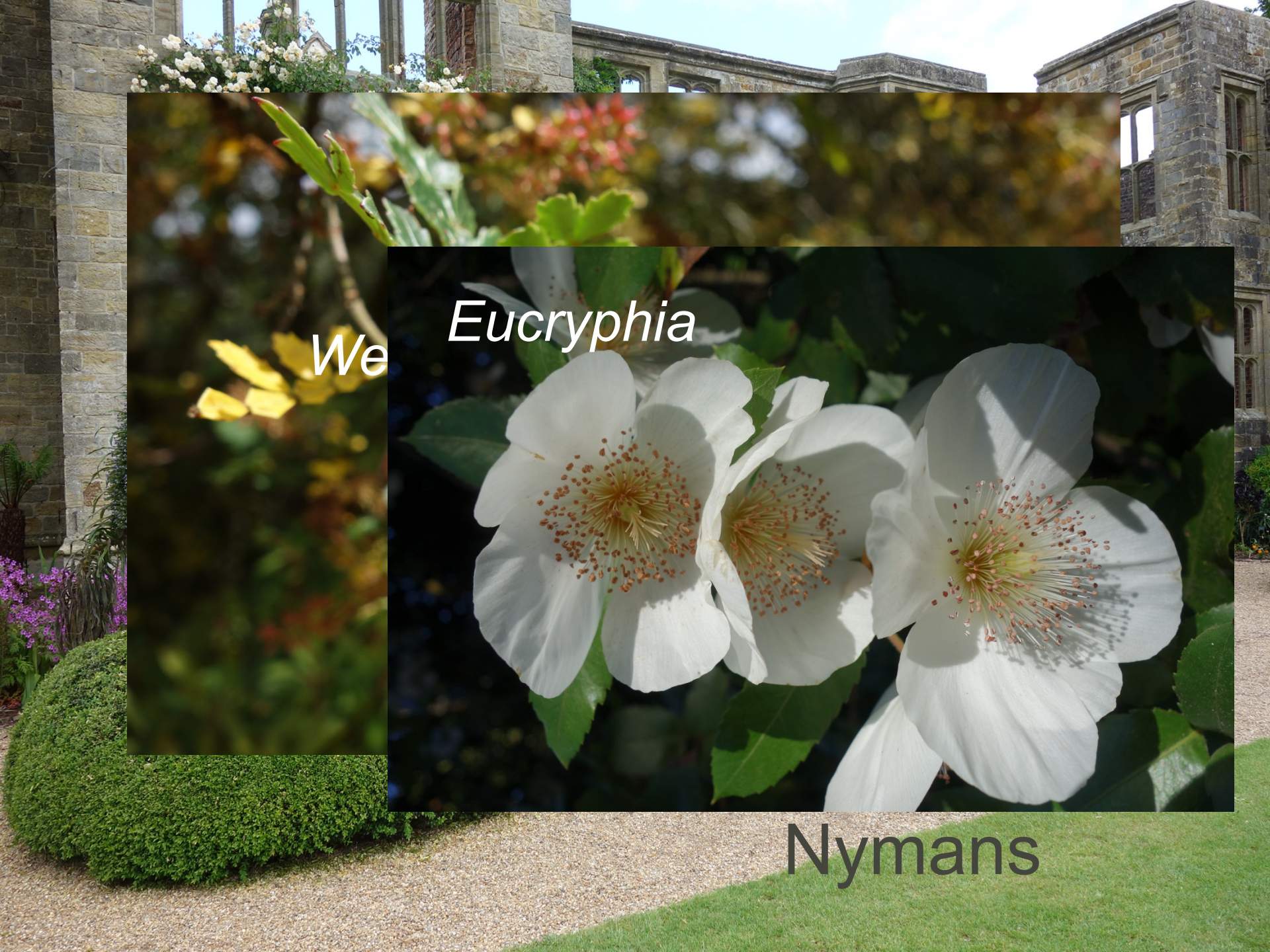
Mammillaria bombycina at Dyffryn



...to great veterans



Ancient sweet chestnut
at Ashridge



We *Eucryphia*

Nymans



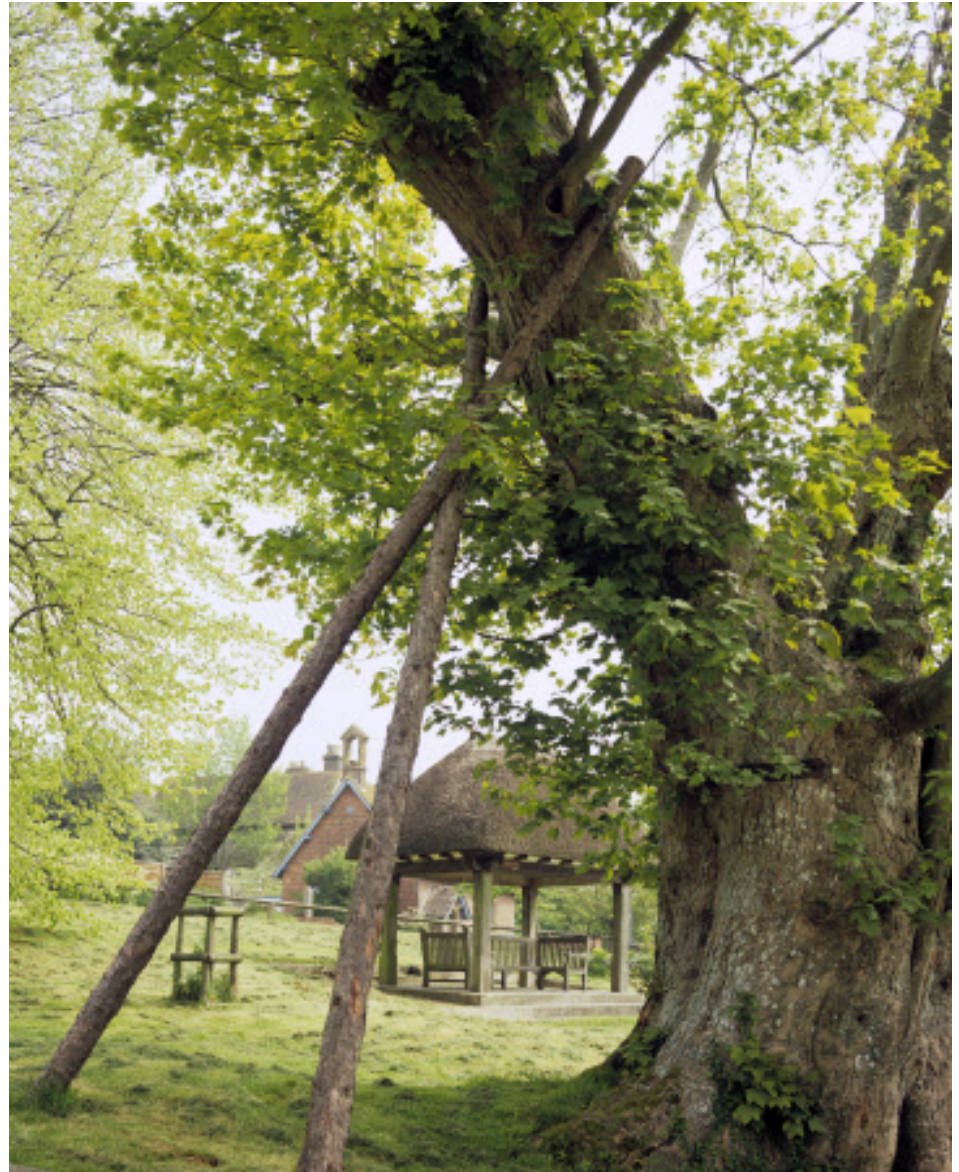
Hanbury Hall



Parkland cedar
at Croome Park



Tolpuddle sycamore



A large, mature tree with a thick, textured trunk and several large, spreading branches. The bark is light-colored with prominent horizontal fissures and peeling areas. The tree is surrounded by dense green foliage and tall grass. A small black identification tag is visible on the trunk. The background shows a dense forest with various other trees.

Wilson's maple
at Dyffryn



Endangered plants



Rhododendron magnificum



Arboretums and forest gardens





Wimpole's South Avenue (elm P.1720) in 1949





Some Challenges

- Scale - number of properties and area covered
- Devolved management
- Climatic range
- Wide range of plants and potential diseases.
- Need for public access
- Large number of visitors
- Wide range of activities
- Tenants



Ukuleles and apple trees





Imported plants for retail





Some plant health issues:

- Shortcomings in both facilities and practice especially for incoming plants
- Lack of coordination and strategic approach to plant health
- Plant retail and events
- Peat-free policy confuses the issues



Objectives:

To develop a standard for plant health to:

- Reduce impact of pests and disease at our properties
- Effectively manage plant health problems and meet our statutory duty
- Provide a framework for guidance on biosecurity and plant health
- Help to coordinate biosecurity across different areas of activity
- Measure achievement of good practice
- Recognise good practice
- Monitoring our progress at a national scale



Finding a Balance

Developing a Plant Health Standard is all about finding a balance between maintaining the human benefits of access to plants and the places they live while managing the risk from pests and disease.

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Ambient vs new and catastrophic pests and diseases

Gardens and parks are home to an enormous variety of pests and diseases, many of which are just part of the landscape.





On-going integrated pest management

- Physical controls
- Biosecurity and hygiene measures
- Biological controls: Protection and enhancement of important beneficial organisms
- Horticultural practices: appropriate pruning, mulching, watering, feeding etc.
- Planting of resistant/tolerant species or cultivars, crop rotation and diversity



Horse chestnut leaf miner (*Cameraria ohridella*)





Ramorum disease at Quarry Bank Mill





Box blight *Cylindrocladium buxicola* at Ickworth





Box substitute at Greys Court





Golden root mealybug *Chryseococcus arecae*





New threats

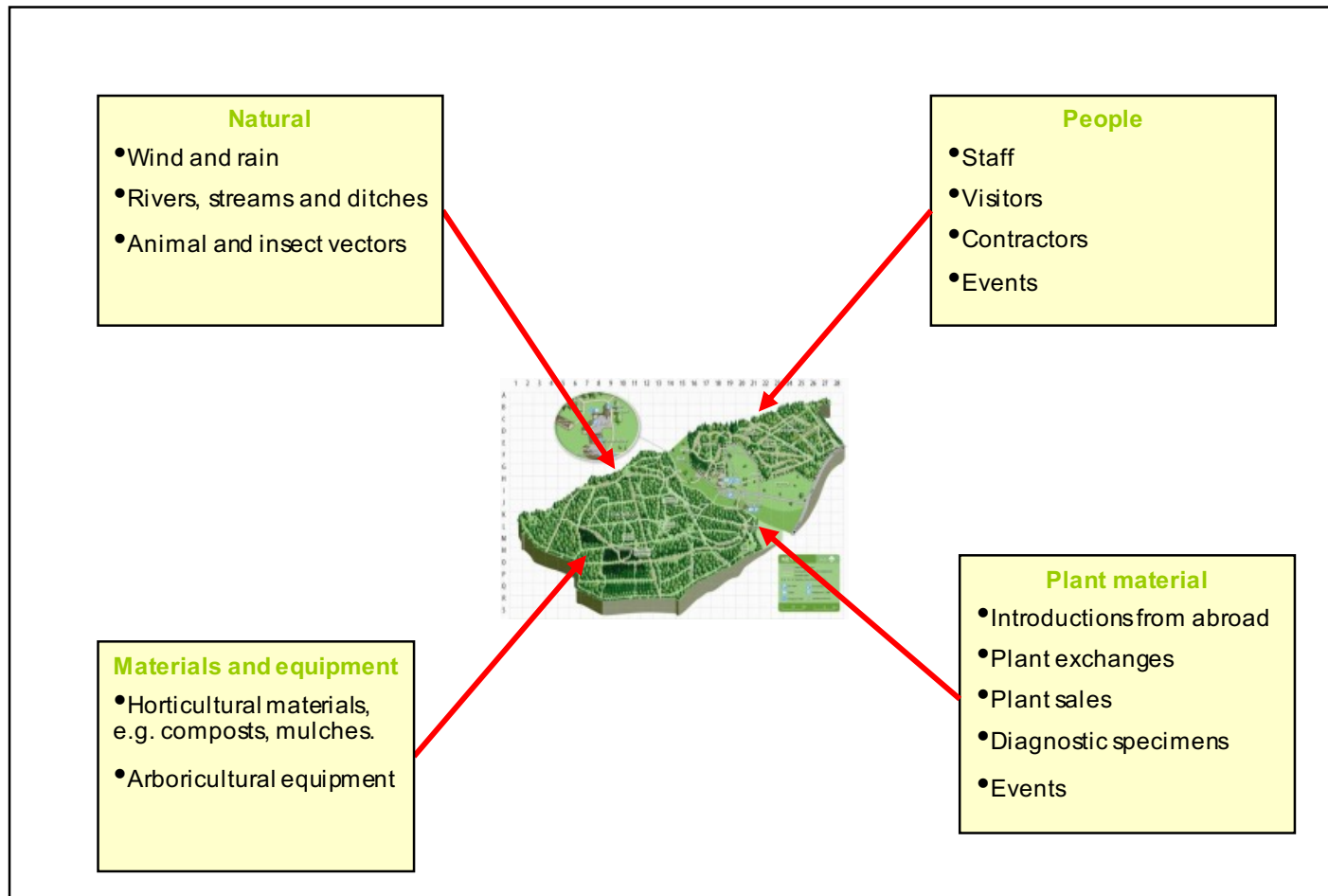


Control measures

- **Exclusion**
- **Containment**
- **Hygiene**
- **Detection**
- **Eradication**



Spotting the pathways for entry





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Turning over a clean leaf

How to protect your garden from
pest and disease invaders

1. Plants coming in: this is the way that most pests and disease-spreading pathogens enter a garden!

What can you do?

- Use reputable suppliers who have been 'checked out'
- Source locally if possible
- Avoid cheap imports and semi-mature specimen trees from abroad

2. Plants on arrival need careful inspection.

Remember to:

- Check paperwork for compliance with purchase order form and plant passport if needed (eg EC Plant Passport UK/EW 12345)
- Only accept delivery if you are sure that the plants are healthy

3. Quarantine areas should be isolated from the main garden and the public.

What more can you do?

- Restrict access to the area
- Be scrupulous about hygiene
- Use dedicated tools
- Hold new arrivals for 2-6 weeks and monitor frequently

4. Day-to-day hygiene: many pests and pathogens are carried on boots!

It's important to:

- Wash all soil and plant material from footwear, and disinfect them
- Clean and disinfect tools and machinery

5. Basic path maintenance can help too.

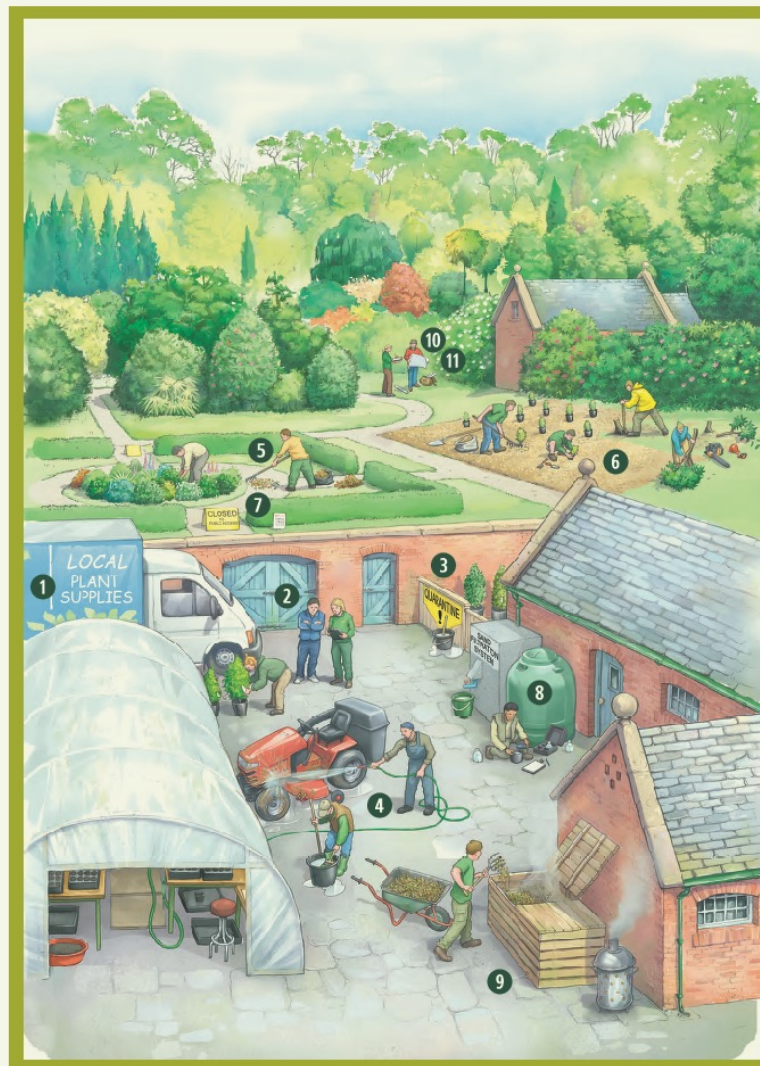
How?

- Surfacing and levelling avoids puddles
- Cleaning and clearing removes leaves and plant debris that can harbour pests and pathogens

6. Good plant husbandry also matters.

What can you do?

- Use the right plant in the right place
- Mulch when planting perennial ornamentals



- to prevent soil splashing onto foliage
- Use space to help ventilation and reduce humidity
- Manage plants to encourage vigorous, healthy growth
- Prevent plants such as Rhododendron ponticum from choking the garden

7. Clear information helps keep visitors informed and aware.

Why put up a notice?

- To inform visitors of serious outbreaks
- To restrict access to ground under repair
- To suggest responsible behaviour eg clean shoes, not taking cuttings, keeping to paths, dogs on leads etc

8. Irrigation water should be clean and free from plant pathogens.

How can you ensure this?

- When using recycled water, eg collected off roofs, try to clean it before use (sand filtration works well)
- Cover water tanks to prevent leaves blowing in
- Regularly test water to check for pathogens

9. Organic waste can harbour pests and pathogens.

What should be done with it?

- All dead plants, prunings, fallen leaves etc should be collected and disposed of safely
- Composting is the best way, as it kills most pests and pathogens
- Or you could collect waste in a covered skip for removal to an approved landfill site
- Small amounts can be burnt where they lie

10. Plant collections know what you've got.

What can you do?

- Make a record of the plants in the garden
- Develop a management plan to conserve important plants
- Propagate important plants through the Plant Conservation Programme

11. Regular monitoring of the health of your plants lets you spot problems early and take prompt remedial action.

What can you do?

- Familiarise yourselves with the main pests and diseases of plants in your garden
- Get problems identified
- Report all suspicious symptoms to your Garden Adviser
- Notify suspect findings of quarantine pest and diseases to Plant Health authorities



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Turning over a clean leaf

How to protect woodlands and forests from pests and diseases

When working in woodlands and forests these are the things you can do to help protect trees from pests and diseases

1. Source nursery stock carefully:

- Know your supplier. Specify provenance, location, size and age.
- Inspect young trees on arrival to ensure they are pest and disease free.
- Check any documentation carefully and keep accurate purchasing and planting records.

2. Avoid spreading pests or diseases:

(a) People

- Remove plant material and soil from boots when leaving a site – use disinfectant if you have visited a high risk site
- Carry a simple 'hygiene' kit (water, container, brush and disinfectant)

(b) Vehicles and equipment

- Use well-made tracks where possible through the forest.
- Clean soil and plant material from vehicles and equipment before leaving the site and visiting other woodlands
- Clean and disinfect chainsaws, processors, sample probes and spades

(c) Timber

- Only move timber if pest and disease free and, if required, has a licence to be moved.
- Clear loose plant debris and soil from timber prior to leaving site

(d) Site

- Keep roads and tracks in a good condition
- Take care to avoid risk of spread of diseased plant material and soil via streams and watercourses.
- Restrict access to areas of suspected or verified infection.

3. Monitor regularly:

- Identify early signs of infection.
- Ensure staff are confident to recognise pests and diseases.
- Report concerns quickly to the relevant plant health service.
- Share information with your neighbouring woodland owners.

4. Give clear information

- Provide clear biosecurity information.
- Clearly identify restricted areas and explain why.
- Ensure all contractors and staff are aware of their responsibility for hygiene and tree health.

5. Woodland management:

- Diversify the forest structure to increase resilience.
- In the event of an outbreak, follow plant health statutory requirements and produce an outbreak management plan.





Setting a Standard





Plant Health Instruction

Plant health Instruction [Compatibility Mode] - Microsoft Word

File Home Insert Page Layout References Mailings Review View Acrobat Design Layout

Clipboard: Cut, Copy, Paste, Format Painter

Font: Arial, 12, Bold, Italic, Underline, Text Color, Background Color

Paragraph: Bulleted List, Numbered List, Decrease Indent, Increase Indent, Line and Paragraph Spacing, Paragraph Style

Table Tools: Design, Layout

Styles: Emphasis, Normal, Strong, Subtitle, Title, No Spacing

Preventing outbreaks

Properties must:

- Ensure staff and volunteers are fully aware of the threat posed by the most harmful plant pests and diseases (identified by Government as quarantine plant pests and diseases or QPDs) and are aware of the measures that would help prevent their entry into our estate. This includes Biosecurity Guidance Documents 1 to 5
- Hold back and monitor new plants intended for planting for at least 6 weeks in an appropriate isolated area prior to planting out. Plant sales are exempt from this holding period but an inspection must be made of all new stock for the presence of pests and diseases before they are placed in sales areas. In addition, plants for retail sales must be kept separate at all times from plants in Trust gardens or intended for planting in Trust gardens. (N.B holding bare root stock intended for some applications such as forestry plantings, may not be practical and will be exempt)
- Ensure all high risk plant material imported directly onto an NT site from an EU supplier have a valid Plant Passport. A phytosanitary certificate will be required for plant material that has been imported from outside the EU. You will retain a copy of the certificate.
- Carry out Pest Risk Assessments on events or exhibitions to be held in a garden, woodland or countryside.
- Assess plant health management annually as part of the CPI process. Relevant assets might include: gardens, woodland, ancient trees, park, landscape, wildlife habitat etc.

Managing outbreaks of notifiable harmful organisms



Plant Health Guidance

The screenshot shows a web browser window displaying a SharePoint page. The address bar shows the URL <https://nationaltrustonline.sharepoint.com/sites/acorn>. The page title is "Acorn - Plant health in garden". The page content includes a list of links, a section titled "Plant Health Standards", and a section titled "Biosecurity posters".

- [Disinfecting footwear and hands](#)
- [Managing gardens to reduce the risk of pests and diseases](#)
- [Guidance for visitors on biosecurity](#)

Plant Health Standards

The Trust's [Plant Health Standards](#) provide a scheme for measuring good biosecurity and plant health management. Achievement of a standard is used as an objective measure within the CPIs for gardens. The scheme has three standards (bronze, silver and gold) which are described in the [Plant Health Standards Checklist](#).

Biosecurity posters

- [Biosecurity poster \(gardens\)](#)
- [Biosecurity poster \(gardens\) - Welsh](#)
- [Biosecurity poster \(countryside\)](#)
- [Biosecurity poster \(nurseries\)](#)
- [Biosecurity poster \(woodlands and forests\)](#)

Advice on specific pests and diseases

There are a number of sources of help to identify and control plant pests and diseases:

The screenshot also shows a Windows taskbar at the bottom with various application icons and a system tray on the right displaying the date and time as 11:43 on 01/09/2017.



Plant Health Guide

http://intranet/intranet/conservation_environment/i-gar-plant_health/gar-plant_health_standards.htm

Plant health standards for g...

Standards Checklist, completed by Head Gardener in consultation with your PM/GM, to planthealth@nationaltrust.org.uk

- Please remember to attach photos where requested to support your assessment for Bronze, Silver or Gold Plant Health Standard.
- A certificate and plaque has been commissioned to recognise the achievement of this award.

National Trust Plant Health Standards video

- If you would like a DVD copy of this 20 minute video or a transcript, please contact planthealth@nationaltrust.org.uk
- This video guide is designed to illustrate our Plant Health Standards and is a good way to ensure that staff and volunteers understand the potential impact of invasive pests and diseases in our gardens. (This will help you meet this requirement in the [Plant Health Instruction](#))

Parks and Gardens - Biosecurity Best Practice Protocols

98% 16:20 28/09/2016

http://intranet/intranet/conservation_environment/i-gar-feature/i-gar-plant_health/gar-plant_health_standards.htm



Plant Health Standard Checklist

The Plant Health Standard scheme is an objective way to measure gardens' performance in managing the risks from pests and diseases. Meeting the bronze standard should be regarded as a good minimum requirement for gardens, and reaching this level is likely to be used as an important element within gardens CPIs. The silver and gold standards demonstrate plant health management above this minimum level.

The following checklist is intended to help garden and property staff assess their facilities and practices and submit an application for a standard award. It should be used in conjunction with the Plant Health Instruction and five Biosecurity Guidance Documents available on the plant health intranet pages at:

http://intranet/intranet/conservation_environment/i-gar-feature/i-gar-plant_health

These documents provide more detailed information about the various criteria including all mandatory requirements.

Once you are ready to apply for an award, the completed checklist and supporting documents should be submitted for assessment via the plant health mailbox planthealth@nationaltrust.org.uk

In order to help judge achievement of the standard, supporting photographs and other evidence (copies of certificates, invoices, training records etc) should be included with the application. The application will be assessed (this may include a garden visit) and if successful, the garden will be awarded a certificate and plaque valid for 5 years.

Bronze Standard  Silver Standard  Gold Standard 

1. Sourcing plants

Standard requirement	Requirement met? (Y/N/NA)	Additional notes including supporting evidence of achievement or progress included
Staff members inspecting plants have a good knowledge of plant health threats, inspection requirements and current legislation.		
Plants are sourced from nurseries with a good track record for supplying healthy disease-free stock. Plants are not accepted from private donations and other sources where there is no knowledge of growing conditions.		
Plants are accurately specified in orders to match need and growing conditions and checked for compliance with order.		
Wherever possible, sourced plants are grown in the UK.		
Mature or semi-mature plants only purchased in exceptional circumstances.		



7 sections...

2. Receiving and Inspecting Incoming Plants

Standard requirement
All incoming plants are received into a suitable holding area separate from existing plants.
All plants are inspected on arrival by a competent person and, where necessary, rejected and supplier informed.
Accurate records (invoices etc) of incoming plants, supplier, date of arrival, previous treatments are easily available.
Good hygiene standards are practiced during inspection.
Wherever necessary, plants have required documentation: phytosanitary certificates for plants imported from the EU; plant passports for susceptible species from the EU. Documentation is retained and easily available.

3. Holding Incoming Plants

Standard requirement
All incoming plants are retained in a holding/quarantine area and monitored for 6 weeks before moving to the garden or mixing with other plants – see Plant Health Standard Checklist for exceptions.
Holding area meets design requirements (see guidance) including restricted access and separation. Area is separate from public access, other areas of the garden, plant production and retail areas.
Tools used in the holding area are marked and restricted to that area or disinfected before use elsewhere.
Holding area floor is kept clean and well drained.
Plants in holding area are well spaced with clear pathways between different incoming batches.
Plants are inspected at least weekly and any concerns recorded. Where necessary suspect plants removed and destroyed.
Disinfection procedures for staff leaving holding area are used.
The holding area is a covered environment such as polytunnel or greenhouse.
The holding area is biologically sealed (spore-proof screens etc) and with a formally drained floor and collected run-off.

4. Risk Management

Standard requirement
Property plant health risk assessment is in place and reviewed regularly in events, exhibitions and other non-horticultural activities.
Significant pest and disease occurrences are reported to Gardens Consultant and National Plant Conservation.
Vulnerable or high risk plants (EG rhododendrons) inspected frequently.
Plants of high significance are identified, recorded and conserved appropriately (EG through duplication).
Regular plant health inspections carried out in the garden.
Plant disease action plan is in place and reviewed.

5. Husbandry and General Maintenance

Standard requirement
Incoming growing media and other plant materials sourced from known, reliable suppliers.
All paths routinely cleared of leaf litter.
Drainage is maintained to minimise risk of waterlogging.
Mulching is used where necessary to reduce soil-borne pathogens.
Soil is actively managed to maintain good growing conditions.
Tools, equipment and PPE are disinfected on diseased or suspect plants.
Barriers used to prevent access to pest affected areas.
High risk species actively managed and contained.
Pruning used where appropriate to reduce contact with soil and open crowns.
Collected water is treated to eliminate pathogens before use.
Garden retail areas regularly inspected for compliance with good plant hygiene.

Plant Health Standard Checklist

6. Composting and Waste Management

Standard requirement
Plant material thoroughly composted before use in the garden in a suitable facility.
Infected or suspect material destroyed or disposed appropriately by burning or removal to landfill.
Turning procedures and temperatures monitored and recorded.
Compost facility has sealed base and sides and leachate collected and prevented from contaminating surrounding garden areas.

7. Knowledge and Training

Standard requirement
Active programme of informing and training staff on plant health risks and the essential requirements for plant health management.
Head gardener (or gardener in charge) regularly updated and is aware of latest plant health and biosecurity guidance and instructions.
Plant health is regularly discussed and reviewed (at least 6-monthly) during gardens meetings.
Plant health risk management requirements included in contracts with 3rd parties.
Engagement with visitors on plant health issues through information or participation EG plant health inspection.
Staff members take a proactive role in maintaining and developing standards of plant health within the garden or country (EG fulfilling champion role, contributing to training events).
Wider (non-horticultural) property staff included in regular plant health discussion and reviews.

Plant Health Standard Checklist

Section	Bronze	Silver	Gold
1. Sourcing plants			
2. Receiving and Inspecting Incoming Plants			
3. Holding Incoming Plants			
4. Risk Management			
5. Husbandry and General Hygiene			
6. Compost and Waste Management			
7. Knowledge and Training			

Property/Garden: _____

Checklist completed by: _____

Date: _____



Plant quarantine site at Montacute







Rowallane





Hygiene and disinfection







Plant waste handling and compost









Property risk assessment



Apple Day at killerton



Knowledge & Training





Keeping things clean at Peckover





Lessons...

- Get high level endorsement
- There is always something more urgent to do so there needs to a 'stick'
- Don't just focus on horticulture/arboriculture. Other activities may be just as risky.
- You can't do everything but make a start
- Recognise achievements and results
- There is a cost but it's just as much about behaviour as facilities