

# PHYTO-THREATS

## Nurseries and Garden Centres Survey Summary Report on Attitudes towards Biosecurity and Accreditation



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# Executive Summary

- This report details findings from a 2019 survey of 100 nurseries and garden centres from across the UK carried out as part of the Phyto-Threats project (<https://www.forestresearch.gov.uk/research/global-threats-from-phytophthora-spp/>). The businesses in the sample grow and trade a range of tree and plant products, with 'main products' often including bedding/ornamentals, hardy nursery stock and edibles.
- In terms of the number of trees and plants supplied, the general public and landscaping businesses are the most important clients for nurseries and garden centres.
- The most concerning pests and diseases for nurseries and garden centres include *Xylella Fastidiosa*, *Phytophthora spp.*, vine weevil, aphids, mildew and ash dieback.
- Few nurseries and garden centres have received any recent training or undertaken educational courses on plant/tree pests and diseases.
- Garden centres and nurseries share some important sources of information when it comes to pests and diseases, notably government departments and agencies (such as DEFRA, FERA, APHA, SASA), others in the tree/plant trade, the RHS and the HTA. In addition, the AHDB is a somewhat important source of information for nurseries. These actors are thus well-placed to raise awareness about pests and diseases and to promote biosecurity practices, training and schemes.
- Nurseries and garden centres were asked about their use of a variety of biosecurity practices informed by existing guidance. These included: drains/free draining gravel beds; raised benches; reliance on UK supplies; water testing; covered water storage; quarantine/holding area; contained composting/incineration facility; disinfection station; covered storage of growing media; boot washing station; vehicle washing station; and water treatment. Some biosecurity practices, such as raised benches, covered storage of growing media, disinfection stations and covered water storage are used by a majority of nurseries, whereas many other potentially important practices, such as vehicle washing stations, water treatment and boot washing stations, are seldom used.
- Use of practices at garden centres differed markedly to nurseries in several instances with drains/free-draining gravel beds, water testing, raised benches being the most commonly used practices. In contrast, water treatment, covered storage of growing media and disinfection stations were among the least commonly used. Despite differences in their most commonly used practices, the challenge (in terms of increasing adoption) would be of similar magnitude in the case of both business types.

- The belief that a practice is inappropriate for the nurseries' and garden centres' site or business model was the most common reason for non-adoption. This could be due to a variety of reasons, such as insufficient space or deeming the practice unnecessary. Few businesses considered cost, use of an alternative, time required, lack of awareness or perceptions of little/no benefit to be the primary reason for not having adopted any of the biosecurity practices.
- There is strong agreement (but particularly among garden centres) about the potential benefit an accreditation scheme could have for safeguarding the wider landscape from the spread of pests and diseases, and for ensuring a better quality of product for consumers. However, there is also concern (particularly among nurseries) over the cost of a scheme for growers and consumers. Moreover, there is some scepticism over the likely interest from consumers looking to purchase accredited products, and whether sufficient growers would seek to gain accredited status.
- On the whole, both nurseries and garden centres consider themselves to be more unlikely than likely to join an accreditation scheme. However, many of the businesses consider themselves to be '50/50 unlikely/likely' suggesting that the specifics of a scheme could be pivotal for generating the uptake needed to produce impact.
- In spite of the potential reduction in stock losses and disruptions to operations that could result from enrolment in an accreditation scheme underpinned by best biosecurity practice, few nurseries and garden centres would be willing to shoulder the costs (or losses) this may bring (e.g. investment in practices, membership fee etc.). In fact, 36% of nurseries and 40% of garden centres would be unwilling to incur any cost whatsoever to gain accredited status.
- However, nurseries' and garden centres' willingness to invest in improved biosecurity practices and pursue accreditation may increase should new pests and diseases (such as *Xylella fastidiosa*) arrive, or if accredited status was deemed desirable or indeed necessary by customers. The types of management practices required, how the scheme is administered and policed, and repercussions for failing to meet standards are just some of the other factors likely to shape nurseries' and garden centres' appetite for accreditation.

# Introduction

PHYTO-THREATS is a collaborative research project involving seven participating institutions from across Britain (Forest Research, James Hutton Institute, Centre for Ecology and Hydrology, University of Edinburgh, University of Worcester, Animal and Plant Health Agency, Science and Advice for Scottish Agriculture). The project is funded by the Living With Environmental Change (LWEC) partnership through the Tree Health and Plant Biosecurity Initiative (THAPBI).

The PHYTO-THREATS project aims to address the risks to UK forest and woodland ecosystems from *Phytophthora* by examining the distribution and diversity of *Phytophthoras* in UK plant nursery systems. It also aims to provide the scientific evidence to support nursery 'best practice' accreditation criteria to mitigate risk of further *Phytophthora* introduction and spread.

To assess the feasibility of an accreditation scheme, Forest Research has been collecting data from nurseries and other stakeholders in the horticultural supply chain. For example, a 2017 survey of 1500 plant-buying members of the British public sought to establish the public's buying habits, the drivers behind these habits, and their appetite for accredited tree and plant products. The survey also quantified the public's propensity to obtain plants from sources other than nurseries, including garden centres (full report available at: [https://www.forestresearch.gov.uk/documents/1779/Consumer\\_survey\\_glossy.pdf](https://www.forestresearch.gov.uk/documents/1779/Consumer_survey_glossy.pdf))

This subsequent report draws on survey responses collected from 100 nurseries and garden centres in early 2019. The survey was designed to elicit information about the businesses' operations and stock movements, levels of awareness around pests and diseases, current use (and non-use) of biosecurity practices, and attitudes towards an accreditation scheme.<sup>1</sup>



<sup>1</sup> Nurseries and garden centres were asked the same questions, including those relating to practice use and accreditation. In reality, an accreditation scheme may require different practices for the two business types, or may be designed exclusively for nurseries.

# Sample Characteristics

Responses were collected from a total of 100 businesses. Fifty-five of these identified as a nursery, 53 as a garden centre, and eight as both a nursery and a garden centre. In terms of geographic spread, the businesses had their headquarters in 44 of the UK's 100 counties. The 55 nurseries were spread across 31 counties while the 53 garden centres were spread across 29 counties. Only one of the 100 businesses (a garden centre) reported to be part of a chain; 92 businesses reported to be independent while seven provided no-response.

The size of the businesses was assessed using three measures; number of employees (Figure 1), annual turnover, and annual spend on buying in trees and plants.

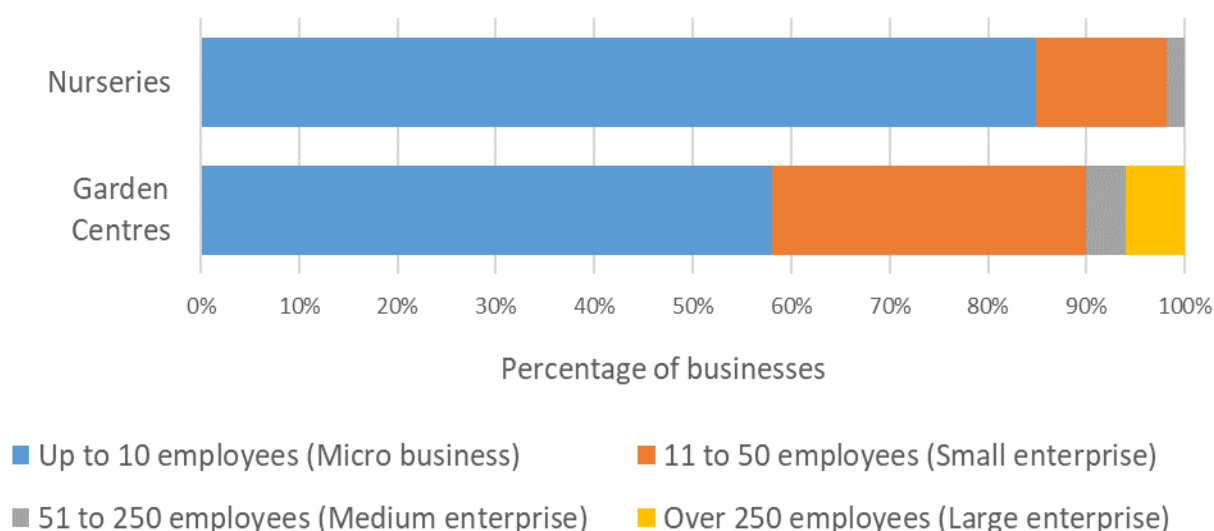


Figure 1 – Business size based on Number of Employees

A majority of nurseries (85%) and garden centres (58%) reported to be micro businesses, categorised as having up to 10 employees. On the whole, garden centres tended to have more employees and thus made up a greater proportion of all other categories. For example, three garden centres (6%) reported to be large enterprises (consisting of over 250 employees), while no nurseries reported to be of this scale.

Annual turnover from the sale of trees/plants (in a typical year) ranged up to £5.5 million among nurseries, with a mean average turnover of £40k. Garden centres reported corresponding figures of up to £7 million turnover per annum, with a mean average turnover of £652k i.e. substantially more than nurseries.

The amount spent on buying in trees and plants (in a typical year) ranged up to £2 million among nurseries, with a mean average of £155k. Garden centres reported corresponding figures of up to £1.3 million spent per annum, with a mean average spend of £162k i.e. marginally more than nurseries on average.

# Key findings

## Products and Movement

Nurseries reported selling between 1000 and 5 million trees and plants in a typical year (mean average 432k), whereas garden centres reported selling between 180 and 1 million trees and plants in a typical year (mean average 151k).

Nurseries' and garden centres' 'main products' (as defined by the individual respondents) are illustrated in Figure 2.

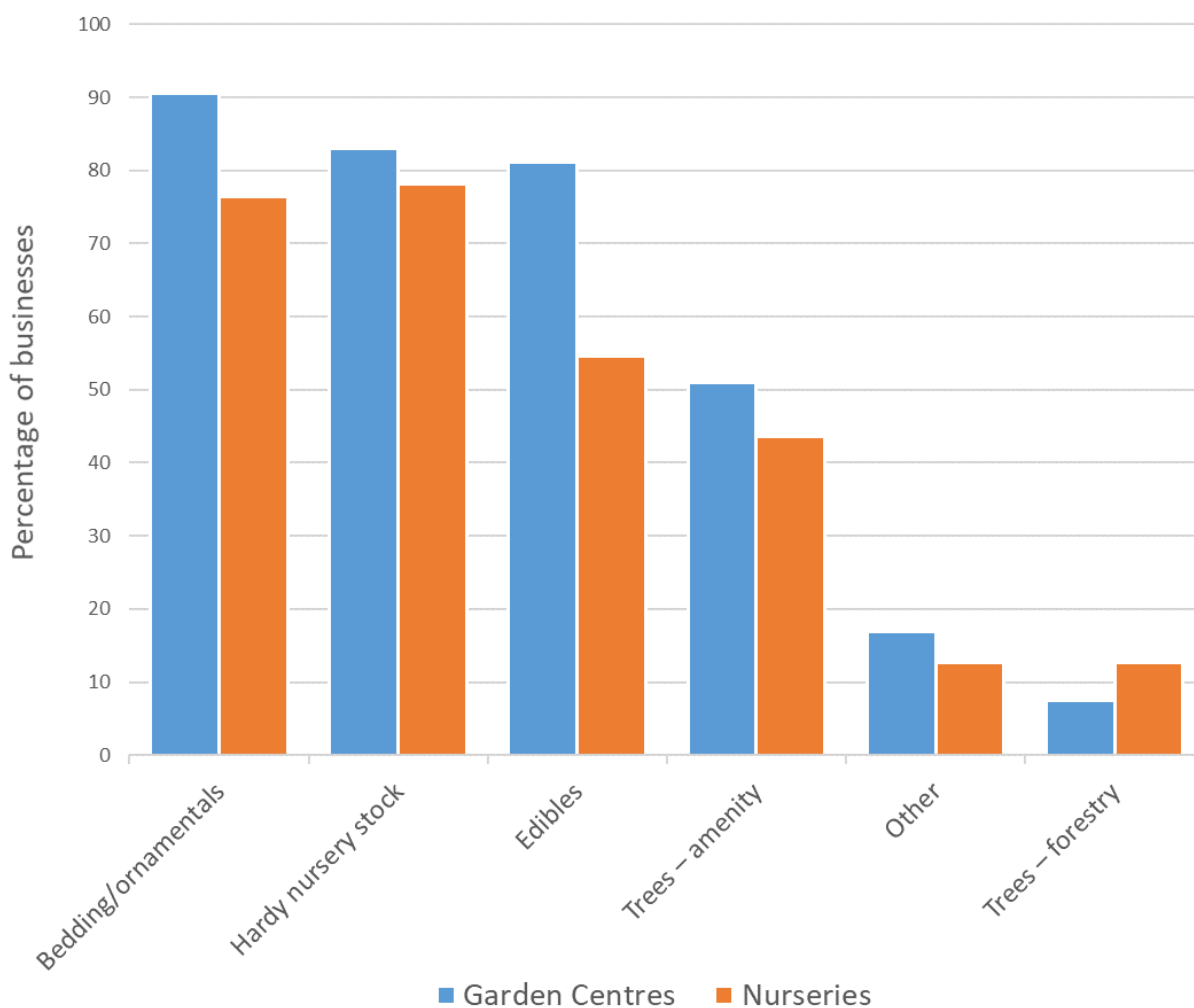


Figure 2 – 'Main products' of Garden Centres and Nurseries

For more than 75% of nurseries and garden centres both bedding/ornamentals and hardy nursery stock represent their 'main products'. A large proportion of garden centres (81%) also consider edibles to be a 'main product'. Edibles tend to be less important for nurseries, though were still considered to be a main product by more than half (55%) of those sampled. Comparatively few of the



nurseries and garden centres sampled were found to specialise in amenity or forest trees.

These figures give some indication of the number and types of products passing through horticultural premises. Relatedly, the findings help us to understand the extent to which an accreditation scheme (underpinned by best biosecurity practices) could help to safeguard the wider environment from pests and diseases, were it to be widely adopted. To further assess this potential impact, it is important to consider the consumers and environments the trees and plants are destined for once sold. Figure 3 illustrates the most important clients, which the nurseries and garden centres identified based on the number of trees and plants they supply to each (three most important clients identified by each nursery and garden centre).

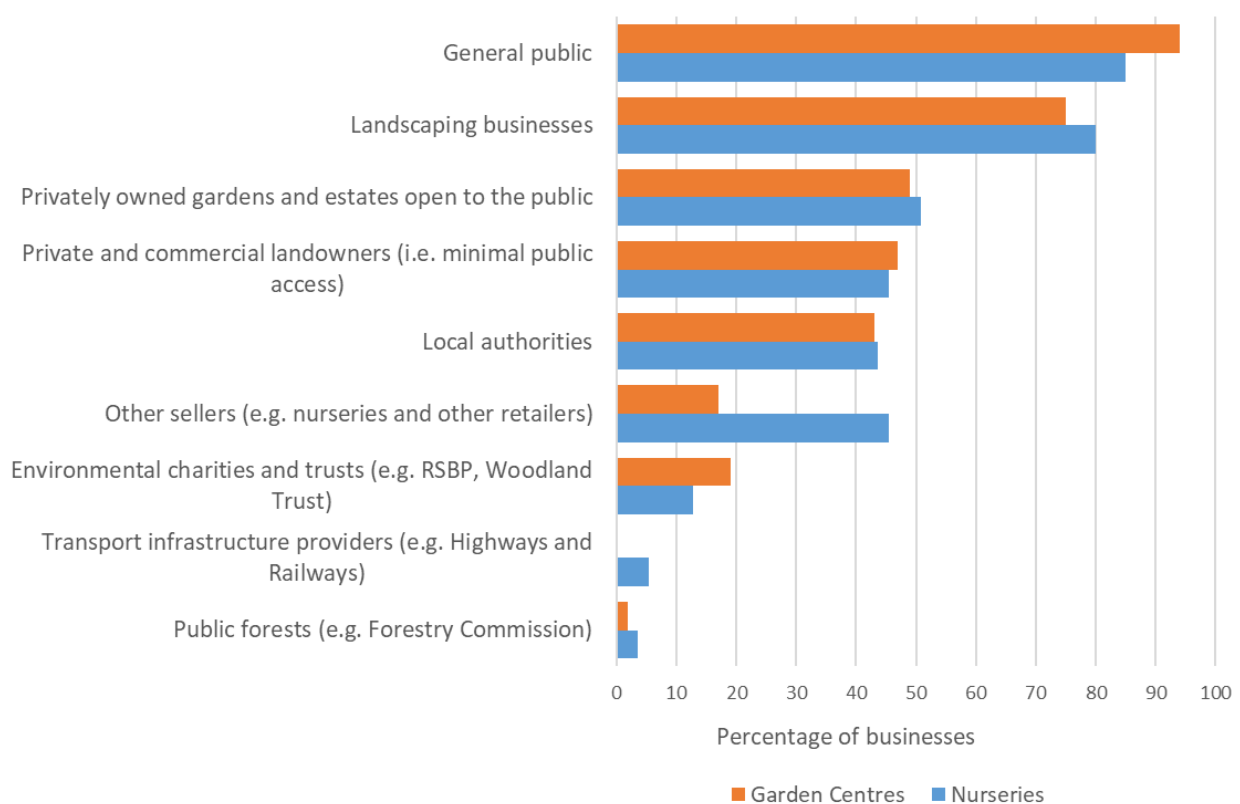


Figure 3 – Nurseries’ and Garden Centres’ Most Important Clients based on Number of Trees and Plants Supplied.

For both nurseries and garden centres, the general public proved to be an extremely important client. In fact, 75% of nurseries and 96% of garden centres deemed the general public to be their most important client in terms of number of trees and plants sold to. Landscaping businesses also proved important, ranking as a ‘top 3’ client for 75% of nurseries and 80% of garden centres.

Between 40% and 50% of nurseries and garden centres identified a) privately owned gardens and estates open to the public, b) private and commercial

landowners (i.e. offering minimal public access) and c) Local Authorities as being among their 'top 3' clients. However, one notable difference to emerge is the comparative importance of other sellers, e.g. nurseries and other retailers, with 45% of nurseries considering this group to be a 'top 3' client in comparison to only 17% of garden centres. In contrast, more garden centres (19%) than nurseries (13%) consider environmental charities and trusts a 'top 3' client.

Other clients such as 'Transport infrastructure providers (e.g. Highways and Railways)' and 'Public forests (e.g. FC)' are rarely considered an important client among the nurseries or garden centres sampled. This perhaps reflects the scarcity of customers in these domains and/or a reliance on a small number of businesses as suppliers. As such, a relatively small number of nurseries and garden centres presumably have a particularly influential role in mitigating the introduction and spread of pests and diseases in certain environments.

## Pests and Diseases

Nurseries and Garden Centres are faced with many existing and potential pest and disease risks. When asked to list up to 5 of the most concerning pests and diseases, over a dozen examples were (cumulatively) recorded by respondents. Figure 4 demonstrates the most frequently cited pest and disease concerns.

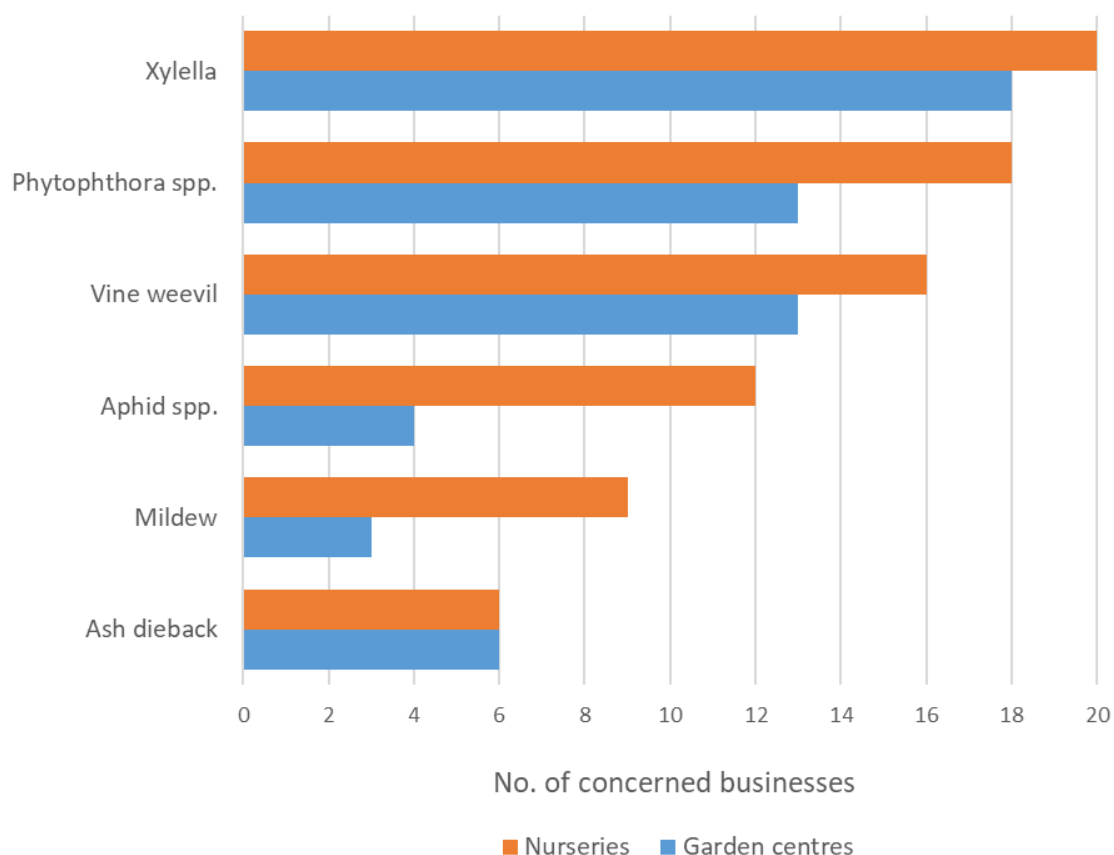


Figure 4 – Pest and Disease Concerns among Nurseries and Garden Centres

Nurseries and garden centres expressed concern for a similar selection of pests and diseases, with *Xylella fastidiosa*, *Phytophthora* species, vine weevil, aphid species, mildew and ash dieback being chief among these. While the types of pests and diseases causing concern to nurseries and garden centres were largely the same, a greater number of nurseries tend to be concerned about any given pest or disease.

Accompanying responses elicited through an open question demonstrate that pest and disease concerns are driven by the number of host species (reflecting the range of stock at risk), cost/inability to prevent impact, past experience, and potential economic losses which could result from future outbreaks.

Networks and communication channels are likely to impact awareness of pests and diseases, and the perceived level of threat. Figure 5 illustrates the reliance on various sources for information on tree and plant pests and diseases.

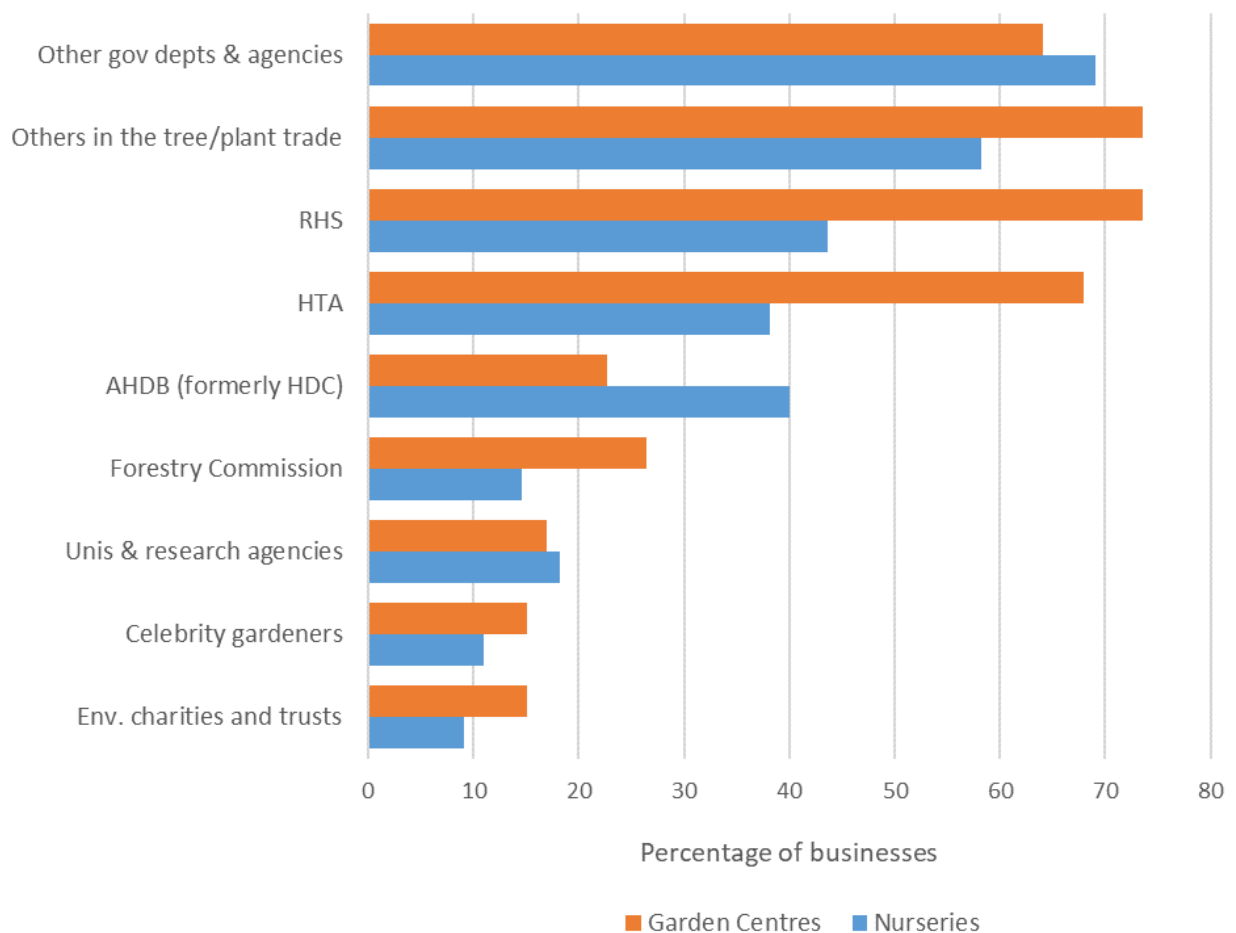


Figure 5 – Sources of Information on Pests and Diseases

Government departments and agencies (such as DEFRA, FERA, APHA, SASA) and others in the tree/plant trade are the most relied upon sources of information on pests and diseases among nurseries, with 69% and 58% of nurseries using these respective sources. The HTA, AHDB and RHS are also somewhat important sources of information, with each being relied upon by between 38 and 44% of nurseries.

For Garden Centres, the RHS (74%), others in the trade (74%), the HTA (68%) and government departments and agencies (64%) represent the most commonly used sources of information regarding pests and diseases.

Universities and research agencies, celebrity gardeners and environmental charities and trusts are relatively unimportant sources of pest and disease information, being relied upon by fewer than one in five nurseries and garden centres.

As well as assisting in raising awareness of threats, the aforementioned relied upon sources are well-placed to provide advice on mitigating the introduction and spread of pests and diseases, for example, by promoting the use of best biosecurity practices among nurseries and garden centres, and by offering or advertising pest and disease related training opportunities. Only 7% of nurseries and 13% of garden centres reported to have received or undertaken formal training or educational courses on plant/tree pests and diseases in the last 5 years.

## **Biosecurity Practices**

Better biosecurity practices can reduce the risk of introduction and spread of pests and diseases. As such, a variety of such practices are already being employed in other countries to mitigate these threats. For example, the California Association of Nurseries and Garden Centres' guidance on best management practices for *Phytophthora ramorum* details several recommended biosecurity practices, as does the Nursery Industry Accreditation Scheme of Australia (NIASA). Drawing on such guidance, our UK sample of nurseries and garden centres were asked about their current use of a variety of biosecurity practices, many of which would likely be used to underpin any future accreditation scheme in the horticultural sector (Figure 6).

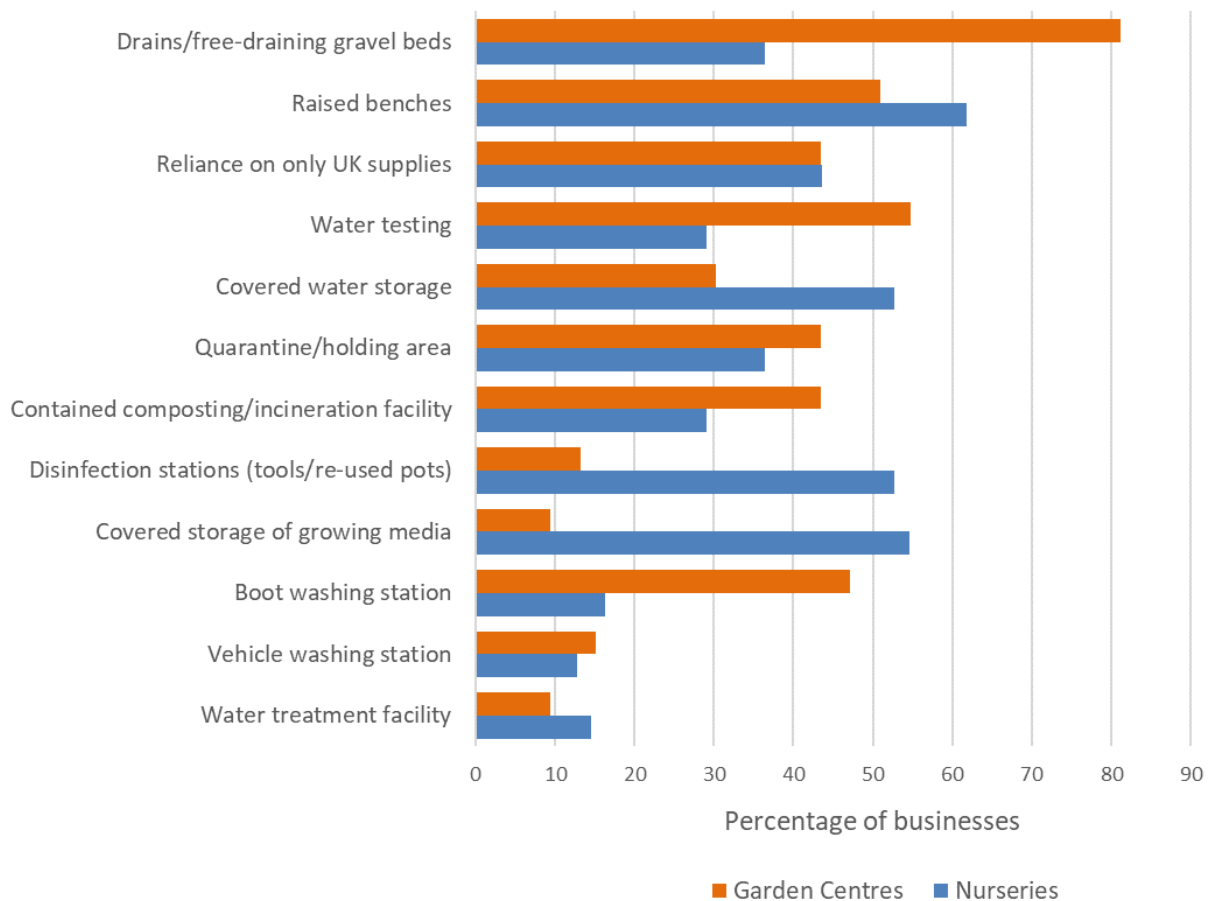


Figure 6 – Use of Biosecurity Practices

As Figure 6 demonstrates, the use of several individual biosecurity practices differs markedly among nurseries and garden centres, perhaps reflecting the different site characteristics, visitors and activities the businesses are involved in as trees and plants move through the supply chain.

A majority of the nurseries reported they use raised benches (62%), covered storage of growing media (55%), disinfection stations (53%) and covered water storage (53%). In contrast, few had a vehicle washing station (13%), water treatment (15%) or a boot washing station (16%).

Boot washing stations appear more commonly used among garden centres, with nearly half (47%) of those sampled reporting to use the practice. Many garden centres also reported to use drains/free-draining gravel beds (81%), water testing (55%) and raised benches (51%). As with nurseries, few garden centres use water treatment (9%) or a vehicle washing station (15%). Other rarely used practices among garden centres include covered storage of growing media (9%) and disinfection stations (13%) – two of the most commonly used practices among nurseries.

Despite the different levels of use, the results suggest that if all of the featured biosecurity practices were to be required in nurseries and garden centres, the challenge (in terms of increasing adoption) would be of the same overall magnitude.

The primary reason nurseries and garden centres gave for not having adopted each practice is illustrated in Figure 7. As shown, by far and away the most frequently cited reason for not adopting practices is the belief that the practice is inappropriate for the nurseries' or garden centres' site or business model. The precise reason why this is believed to be the case may differ both in respect of the business, and the individual practice. Some businesses may have space restrictions which hinder the adoption of practices likely to require a substantial area, for example the establishment of a quarantining/holding area. Other practices may be deemed inappropriate because they are seen as unnecessary. This could be the case for businesses that don't use water treatment, perhaps because they rely wholly on an already treated mains water supply.

Interestingly, few nurseries and garden centres considered either cost, use of an alternative, time required, lack of awareness or perceptions of little/no benefit to be the primary reason for not having adopted the featured practices. However, for each of the practices, several businesses reported 'other' (non-specified) reasons for having not adopted. This finding suggests that further (qualitative) research is needed to help establish more nuanced barriers to adoption.

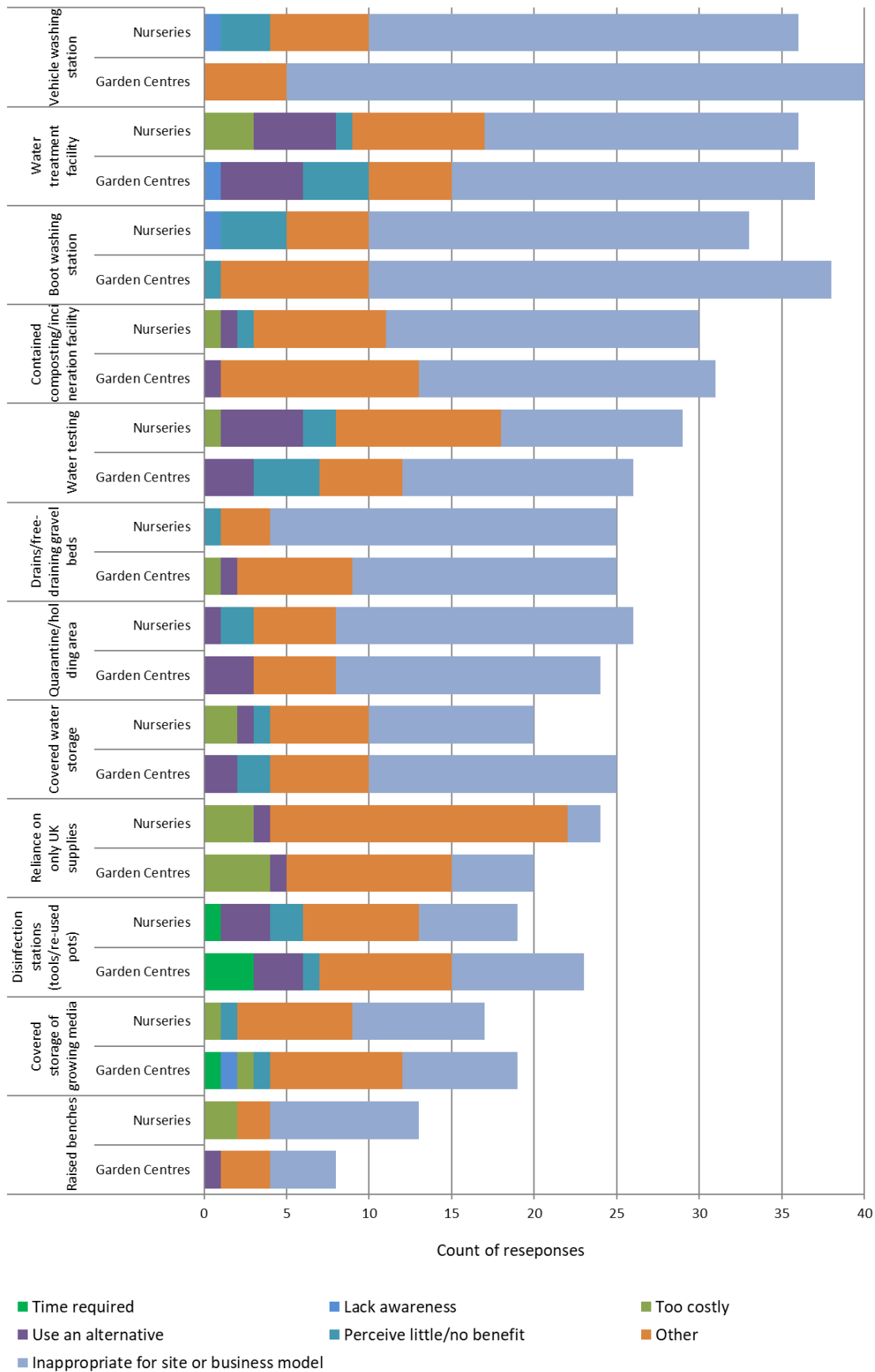


Figure 7 - Reasons for Non-adoption of Biosecurity Practices

## Accreditation

For an accreditation scheme to be successful widespread uptake will be necessary. However, if those within the plant trade are expected to voluntarily pursue accredited status, it is important to understand their perceptions around the potential opportunities and challenges this would bring. Figure 8 summarises the level of agreement nurseries and garden centres expressed in relation to several statements, each with an implication for the establishment and uptake of a scheme.

There is notably strong agreement on the potential benefit an accreditation scheme could have on safeguarding the wider landscape from the spread of pests and diseases (87% of garden centres and 81% of nurseries agreeing or strongly agreeing), and in ensuring a better quality of product for consumers (81% of garden centres and 73% of nurseries agreeing or strongly agreeing). While the vast majority of both nurseries and garden centres expressed agreement with these statements, in both cases garden centres tended to express stronger agreement.

Despite the perceived benefits, many nurseries (86%) and garden centres (69%) expressed concern over the costs of a scheme for growers and their consumers. Perhaps relatedly, half (50%) of both nurseries and garden centres suspect there would be a lack of interest from consumers seeking to purchase accredited tree and plant products. In addition, there is scepticism over whether sufficient growers of trees and plants would be interested in gaining accreditation, which would of course limit a scheme's reach and impact. This scepticism is higher among nurseries (62% of nurseries agreeing or strongly agreeing in comparison with 46% of garden centres).



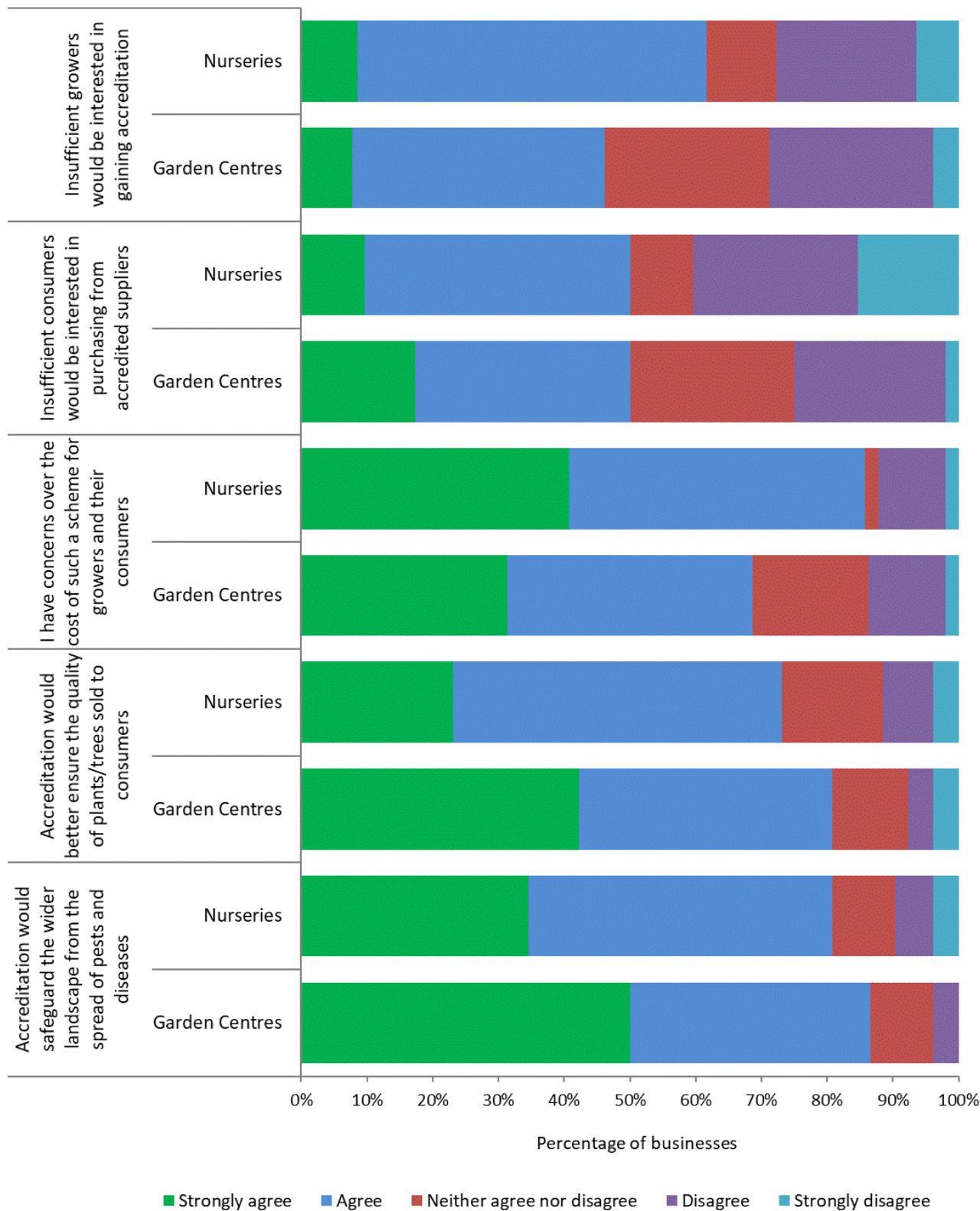


Figure 8 – Perceptions around an Accreditation Scheme

Presumptions about the limited number of growers interested in gaining accreditation appear to have been borne out when the sample reported their own likelihood of joining an accreditation scheme (Figure 9).

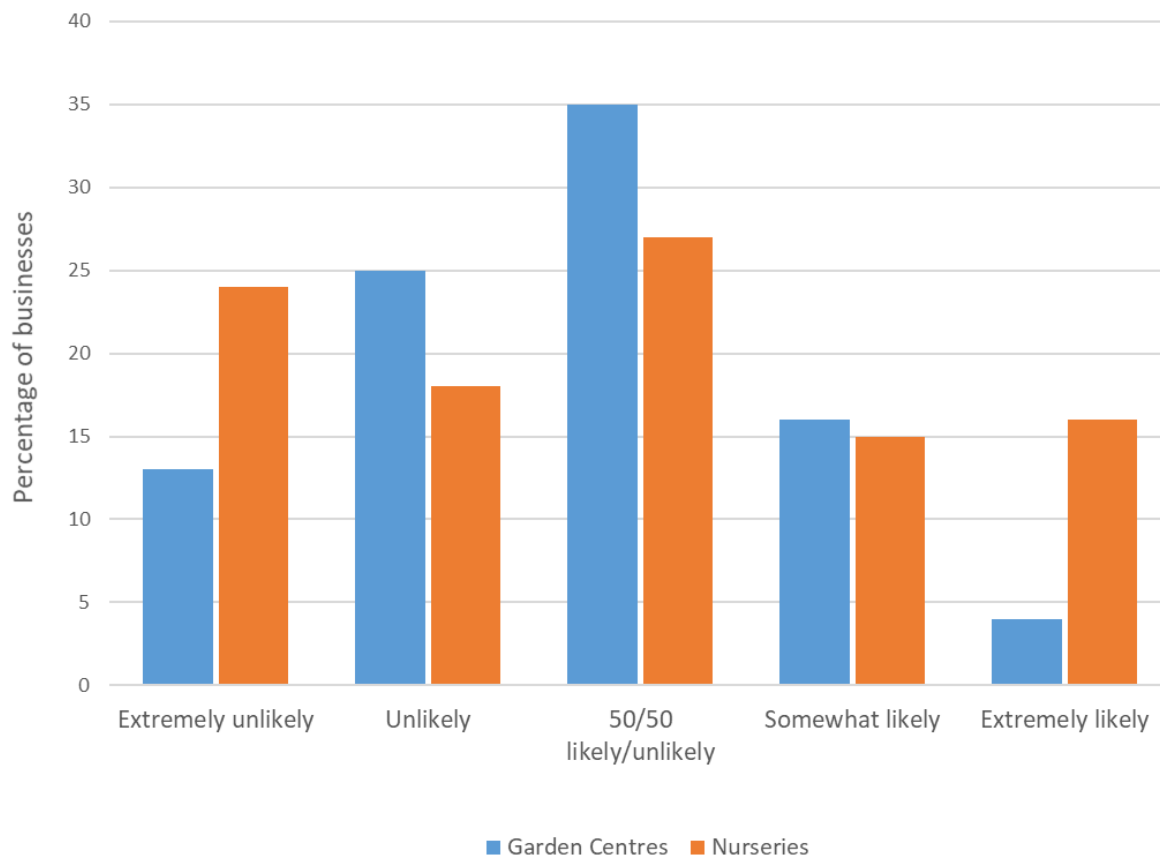


Figure 9 – Likelihood of Joining an Accreditation Scheme

Responses from garden centres in respect of likelihood of joining an accreditation scheme were somewhat normally distributed with the greatest number of responses (35%) being '50/50 likely/unlikely'. However, in total responses for unlikely and extremely unlikely (38%) outnumbered the more positive responses of somewhat likely and extremely likely (20%). Only 4% of garden centres considered themselves extremely likely to join an accreditation scheme.

Responses from nurseries were more evenly distributed, with each response category fielding between 15% and 27% of the responses. As with garden centres, nurseries on the whole reported to be more likely to consider themselves unlikely or extremely unlikely (42%) to join an accreditation scheme than somewhat likely or extremely likely (31%). However, this difference is less pronounced than with garden centres. In addition, 16% of nurseries consider themselves extremely likely to join an accreditation scheme – some four times the proportion of garden centres.

Whether attitudes towards joining an accreditation scheme would differ when presented with definitive information on what accreditation would entail is difficult to predict without further, more in-depth (qualitative) research. Consumer demand, practices necessitated, scheme administration and policing, and repercussions for failing to meet standards are just some of the factors that could alter a business' likelihood of joining a scheme. Associated cost (or loss) is also likely to be a pivotal factor, with 36% of nurseries and 40% of garden centres stating that they would not be willing to incur any cost in order for their business and its stock to become accredited (Figure 10). Moreover only 13% of nurseries and 19% of garden centres stated that they would be willing to incur costs of over 10% or more to attain accredited status (all premiums relative to existing business costs per annum).

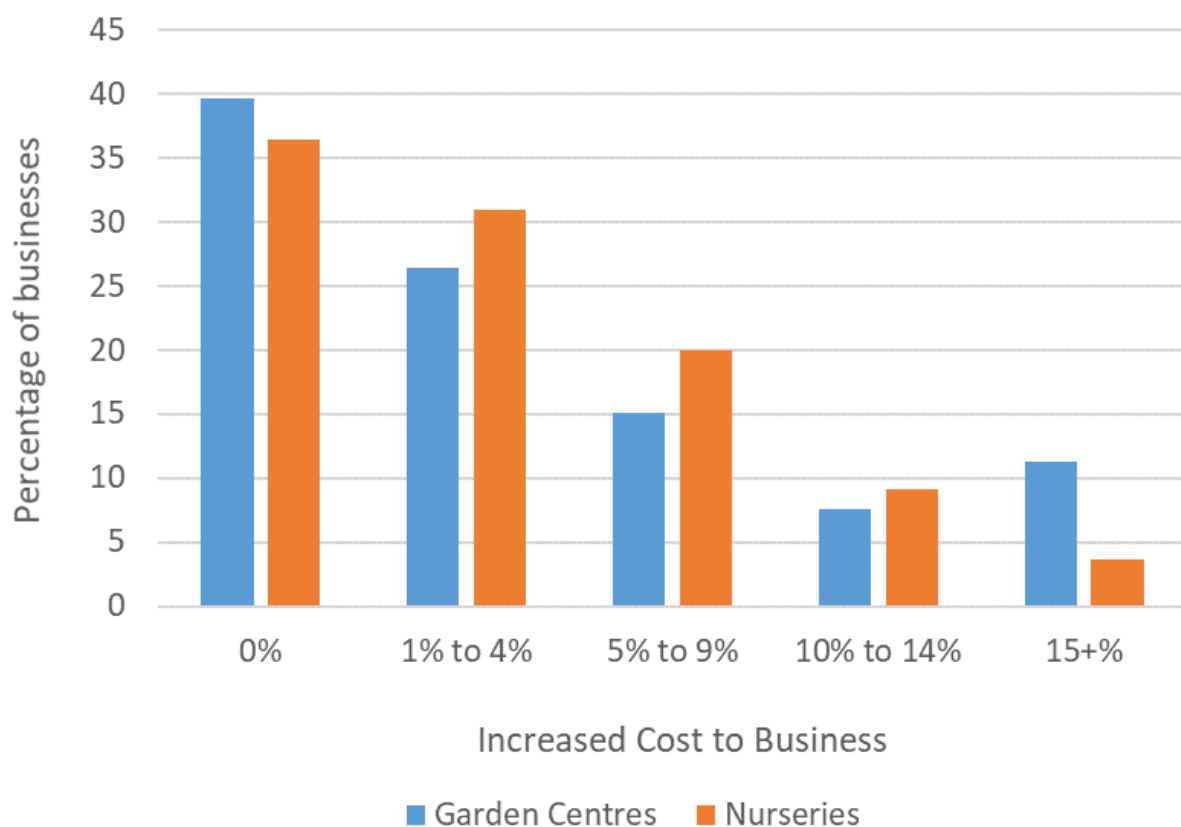


Figure 10 – Willingness to Incur Cost to Attain Accredited Status for the Business and its Stock

Despite this apparent reluctance to incur costs, it is also worth noting that participation in an accreditation scheme (or at least adopting the practices which underpin it) could negate losses from not only existing but also emerging threats, such as *Xylella fastidiosa*. For example, a quarantine area would help to prevent spread to other stock, premises and environments. Were such threats to materialise in the UK, improved biosecurity practices and interest in

accreditation may gain more traction as businesses strive to reduce losses to their stock and the costs associated with disruption to their operations.

Openness to accreditation among growers and traders of trees and plants would also likely increase if accredited status was deemed desirable or indeed necessary by their clients, particularly the likes of the general public and landscaping businesses.

PHYTO-THREATS is funded jointly by a grant from BBSRC, Defra, ESRC, the Forestry Commission, NERC and the Scottish Government, under the Tree Health and Plant Biosecurity Initiative.

To learn more about the project please visit:

<https://www.forestry.gov.uk/fr/phytothreats>

Or contact the project lead, Dr Sarah Green: [sarah.green@forestresearch.gov.uk](mailto:sarah.green@forestresearch.gov.uk)

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