



Royal Horticultural Society (RHS)
Industrial Transition to Peat-Free Survey
2023 Report

RHS, Defra and Industry 'Transition to
Peat-Free' Fellowship Project

September 2023

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Executive Summary:

This survey was undertaken as part of the collaborative fellowship project titled 'Transition to Peat-Free' fellowship, which includes the Royal Horticultural Society (RHS), industry partners and Defra. The National Trust also supported by providing a list of their peat-free suppliers, which was combined with an existing RHS peat-free list. Survey responses were obtained from horticultural businesses including micro, small, medium and large businesses as categorised in the [Horticulture Sector Skills Survey – Sub-Sector Report: Ornamental Plant Production](#) (Pye Tait, 2019)¹. This survey shares baseline industry data on the 2023 status of the transition to peat-free across horticultural businesses. The data aims to focus the research areas of the fellowship and will be used to provide government and industry with recommendations and suggestions on achieving a sustainable transition to peat-free.

The sustainable transition to peat-free will help towards reversing the climate and biodiversity crises and deliver on [Climate Change Committee \(CCC\) Mitigation Monitoring Framework](#)², [Government's Net Zero Strategy](#), (The Environmental Improvement Plan 2023 - GOV.UK (www.gov.uk)³, the England Peat Action Plan (EPAP)⁴ and the [COP15: Global biodiversity framework - House of Lords Library \(parliament.uk\)](#)⁵.

Peat-free status of UK horticultural businesses:

Of the 858 horticultural businesses sent the survey, 50% (n=427) responded. Of these

- 29% (n=124) grow peat-free across all plant ranges/types
- 17% (n=73) grow 100% peat-free, including propagation across all plant ranges/types, except for palms.

The RHS is aware of an additional 24 UK horticultural businesses (who did not respond to this survey) growing peat-free. Of these two are 100% peat-free, including propagation, while the remaining 22 are peat-free with the exception of young plants, propagation materials, and incoming materials.

The 2023 list of current peat-free suppliers obtained from this survey is shown in Appendix 1.

Peat-free timeline: When horticultural businesses aim to be 100% peat-free:

¹ 2019 Horticulture Sector Skills Survey – Sub-Sector Report: Ornamental Plant Production, A report for the Ornamental Horticulture Roundtable Group, Pye Tait, October 2019 - <https://www.rhs.org.uk/science/pdf/horticulture-skills-report/sub-sector-report-ornamental-plant-production=pdf>

² Progress in reducing UK emissions 2023, Report to Parliament Climate Change Committee June 2023 - <https://www.theccc.org.uk/wp-content/uploads/2023/06/Progress-in-reducing-UK-emissions-2023-Report-to-Parliament-1.pdf>

³ Environmental Improvement Plan 2023, First revision of the 25 Year Environment Plan - https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1168372/environmental-improvement-plan-2023.pdf

⁴ England Peat Action Plan, May 2021 - https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1010786/england-peat-action-plan=pdf

⁵ COP15: Global biodiversity framework, Jan 2023 - <https://lordslibrary.parliament.uk/cop15-global-biodiversity-framework/>

Of 87% (n=370) of horticultural businesses that responded, 51% (n=188) expect to be 100% peat-free in all operations by the end of 2026. 3% (n=10) by the end of 2028, 2% (n=7) by the end of 2030, 2% (n=6) after 2030. 2% (n=6) do not aim to participate in the transition. 40% (n=153) of businesses responded with "can't say as it depends on...". The dependable factors include: the availability of suitable peat-free products in terms of quality, consistency and performance; anticipated results from the ongoing peat-free trials; costs and economics; peat-free status of incoming young materials/liners and Defra (government) legislation on the peat ban for the professional sector.

Plug plant production status in UK horticultural businesses:

Of the 90% (n=383) of businesses that responded:

- 74% (n=284) sourced plugs/young plants from external suppliers rather than producing their own
- 26% (n=99) produced their own.
 - Of this 26% (n=99), 50% of plug plants produced were in peat and 50% in peat-free.

A follow-up question asked whether horticultural businesses had asked their supplier to supply them with 100% peat-free plugs or young plants, and 94 businesses responded. Of these:

- 64% (n=60) had not asked
- 36% (n=34) businesses had asked

The reasons for horticultural businesses (n=60) not asking for peat-free plugs were:

- 20% 'Never thought to do this, as I am a small grower'
- 14% 'Will ask when there will be sufficient demand for 100% peat-free plants (including plugs) in the market'.

It is recommended that all horticultural businesses request 100% peat-free plug plants/young plants from their suppliers. If suppliers cannot do this then businesses should ask for the reasons as to why this is not possible. It is thought that this collective horticultural industry 'consumer ask' may help to shift UK and overseas plug plant/young plant suppliers to provide 100% peat-free plug/young plants.

Range of plants grown in peat, peat-reduced, and peat-free growing media (GM):

- Results show that the majority of horticultural businesses across all plant ranges have already transitioned to peat-reduced GM and that industry is using peat-free GM to grow across all plant types (<https://www.rhs.org.uk/plants/types>).
- Plant types predominantly being grown in peat-free GM are aquatic plants (75%), culinary herbs (66%), bulbs (65%), cacti and succulents (59%) and alpines (58%).

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Followed by herbaceous perennials (57%), indoor houseplants (53%) and grasses (50%).

Overall, this indicates a positive trend towards the peat-free transition and reflects the industry's challenges and focus plant areas which need to be scientifically addressed to assist horticultural businesses to shift from peat-reduced growing to fully peat-free growing.

Estimated volumetric use of peat-free, peat-reduced and peat-based growing media:

Based on 74% (n=297) responses the average % volume of total growing media utilised is:

- 60% peat-free
- 29% peat-reduced
- 11% peat-based

Peat-free mixes used by UK horticultural businesses:

- 68% (n=204) of respondents use commercially available peat-free mixes
- 20% (n=60) use both commercially available peat-free mixes and prepare their own blend of peat-free mixes
- 12% (n=35) formulate their own peat-free blends

Peat-free growing media (GM) components:

The main peat-free GM components used are bark, wood fibre, coir and composted green waste. In addition, perlite, vermiculite, loam, grit and sand are used to improve physical properties, while controlled release fertilisers (CRFs), anaerobic digestate and worm cast products are used as nutritional components.

Peat-free growing media (GM) brands used:

UK horticultural businesses predominantly use the following GM brands. Listed alphabetically: Bulrush, Dalefoot, Jiffy, Klasmann-Deilmann, Levington/ICL, Melcourt, Petersfield, and Westland/Sinclair. Other GM brands, listed alphabetically: Caledonian Horticulture, Fertile Fibre, Gardenscape, House Plant Focus-growth Technology, Lensli Substrates, and van der Knapp.

Cost difference between peat-reduced and peat-free growing media (GM):

The cost difference between peat-reduced and peat-free GM per m³ was an increase of 15-25% for peat-free GM.

Supplementary ingredients used when handling peat-free mixes:

With 65% (n=277) of businesses responding, supplementary ingredients used when handling peat-free mixes were:

- 52% (n=143) slow-release fertilisers
- 42% (n=117) controlled-release fertilisers
- 42% (n=116) liquid feed
- 12% (n=34) indicated that they used none of the ingredients listed in the survey

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- 11% (n=31) used other ingredients including anaerobic digestate, bark, biochar, grit, lime, loam, nematodes, organic fertilisers, perlite, sand, vermiculite and worm cast products when handling peat-free mixes.

Assistance to help industry transition to peat-free:

Of all survey respondents, 87% (n=373) of businesses responded. Of these:

- 18% (n=98) of horticultural businesses need technical support on how to grow peat-free
- 17% (n=97) of businesses would benefit from a knowledge/information hub for growers
- 16% (n=90) of respondents indicated that financial support/subsidies from the government would help to support their peat-free transition
- 13% (n=75) requested other forms of support including i) the availability of a consistent product; ii) the availability of peat-free propagation/peat-free plug plants, peat-free liners and information on the peat-free status of incoming materials; and iii) solutions for challenging plant groups.
- 10% (n=54) would benefit from training/workshops on peat-free growing
- 9% (n=49) need technical assistance to set up trials at nurseries
- 8% (n=43) would benefit from financial support from the government towards necessary equipment and facilities to support their transition to peat-free growing
- 10% (n=54) 'none of the above' in terms of support/assistance

Technical support from the Royal Horticultural Society:

Of the 427 businesses, 62% (n=266) responded. Of these:

- 42% (n=112) stated they would welcome technical support from the RHS
- 25% (n=65) responded that they were unsure about welcoming this technical help
- 19% (n=51) indicated that they would not take up the offer
- 14% (n=38) indicated they need different forms of support, which includes online resources on peat-free growing, growers factsheets, technical reports and technical assistance by email and newsletters

The top five challenges and advantages of growing peat free:

Of all businesses, 65% (n=277) reported the top five challenges and advantages with peat-free growing being:

Challenges:

- Irrigation management (55%, n=151)
- Cost (42%, n=115)
- Feeding/nutrition management (38%, n=106)
- Slow plant growth (25%, n=69)
- Poor root growth (23%, n=63)

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Advantages:

- Reduced lichen growth saves time in dispatch, and less media needed (26%, n=72)
- A well-established root system (16%, n=44)
- Less volume of growing media used (GM) (16%, n=44)
- Improved scope for beneficial microbial activity (10%, n=28)
- Improved control of root and aerial diseases (7%, n=20)

Estimated annual nursery-generated organic materials:

Of all survey respondents, 89.3% (n=381) responded. It is estimated that 128 businesses who have in-house composting facility could collectively generate a minimum of 4828 m³, a mean of 7897 m³, and a maximum of 11100 m³ green waste per annum. This amount of organic material has enormous potential for re-use in their or other businesses.

Continued support for the RHS, industry and government peat free fellowship:

Of the 427 survey respondents, 89% (n=379) responded that they will continue to support the RHS, industry and government transition to peat-free fellowship research. This shows a positive will for the industry to transition to peat-free.

Recommendations and suggestions for the government:

Equipment and infrastructure: The government should provide additional fiscal incentives specifically for the transition to peat-free, for GM manufacturers and growers. This could include grants, funding and loans for equipment and infrastructure changes necessary to adapt the business for peat-free growing media manufacturing and peat-free growing. This funding should be different to funds already available from government and be specifically for industry to transition to peat free.

Cost difference between peat-reduced and peat-free GM: In this survey, cost was identified by horticultural businesses as being the second biggest challenge to them transitioning to peat-free. In particular, there was an increased cost from peat-reduced to peat-free GM per m³ of 15-25%. Government should provide tax relief, or another mechanism, to cover the price difference between peat-reduced and peat-free grown plants for GM manufacturers and growers.

Research and technical support: Government to continue to support the RHS, industry and Defra 'transition to peat-free fellowship' project to assist UK horticultural businesses to overcome technical challenges. In this survey, 42% of horticultural businesses indicated needing additional technical support from RHS to facilitate their transition. Government to provide increased financial support for the fellowship for an RHS technician to help businesses accelerate their transition to peat-free.

Knowledge transfer: Government to provide increased financial support for the knowledge transfer of RHS research and enhanced networking opportunities with industry.

Price of woodchip and raw materials: In this survey, cost was identified by horticultural businesses as being the second biggest challenge to them transitioning to peat-free. As with the woodchip energy-based industry, the government should provide similar subsidies for the horticultural industry to increase the affordability of wood-based raw materials (which are a primary component of peat-free GM). This will help to bring down the price of peat-free GM for GM manufacturers and growers.

Removing red tape - waste Legislation: Government to streamline the procurement of raw materials to replace peat by removing red tape on waste legislation. At present, once a material is designated as 'waste', numerous approval processes are required to be able to use it. Anaerobic digestate solids and wood products from recycling are examples currently under debate. Government must reduce the time it takes to get waste materials approved for use by the horticultural industry. Government also need to help industry obtain full support from the Environment Agency for re-using designated waste material as 'resources' for GM applications.

Contamination and green waste - waste legislation around 'green waste': Government to work with councils to remove the inclusion of contamination clauses in their contracts with composters, which would free up large amounts of clean raw materials to replace peat in the manufacture of GM. If councils 'accept' 3% contamination with green waste recycling, then this is not useable for GM manufacturers. Composters with contracts should be forced to recycle their material i.e. produce the best possible compost rather than producing a low-grade contaminated material. GM manufacturers need this high-quality material to help them transition to peat-free.

Recommendations and suggestions for the industry:

Obtaining peat-free propagules and peat-free young plants: It is recommended that all horticultural businesses directly ask their UK and overseas suppliers to supply them with peat-free plug plants/young plants. If suppliers say they cannot supply them then industry should ask for reasons as to why this is not possible. This collective horticultural industry 'ask' may help to shift plug plant/young plant suppliers to providing 100% peat-free plug/young plants.

Governmental lobbying: It is suggested that all UK growers and grower associations write to their local MPs and include in their letter the recommendations and suggestions for government listed above in this report. This collective UK industry voice should help MPs better understand how they can support a sustainable transition to peat-free.

Peat-free nursery trials and maintaining internal quality control: It is highly recommended that growers set up small and manageable peat-free trials in their commercial setting (with at least 3-4 different peat-free mixes to compare with their standard nursery control).

Cost of growing media: In this survey, cost was identified by horticultural businesses as being the second biggest challenge to them transitioning to peat-free. GM prices vary across different GM manufacturers. It is highly recommended that horticultural businesses first gain confidence in the use of particular peat-free GM mixes from trials, and then regularly review their GM suppliers/manufacturers to obtain the best prices, quality/consistency, service and technical support for the particular GM formulations identified to be most effective, and request to be informed of any future changes to GM formulation mixes.

Costs across the supply chain: In this survey, cost was identified by horticultural businesses as being the second biggest challenge to them transitioning to peat-free. It is suggested that all growers (no matter how small) negotiate decreases in costs with peat-free GM suppliers and plug/young plant producers and negotiate increases in cost from buyers of their peat-free products. These 'collective asks' aim to spread the cost difference of peat-free across the whole supply chain.

Overcoming technical barriers: The top four technical challenges in this survey associated with peat-free growing were irrigation management, feeding/nutrition management, slow plant growth and poor root growth. It is recommended that horticultural businesses:

- Review the RHS, industry and government peat-free fellowship peat-free grower list in Appendix 1 and talk to horticultural businesses who have successfully transitioned to peat-free to learn from their experiences.
- Start their own small-scale trials in a commercial setting working with at least three different peat-free GM manufacturers. Observe the technical challenges, note the successes and failures and share results where possible.
- Set up an internal quality control protocol to monitor incoming peat-free GM by sending samples of received GM for analysis. If the media does not meet the required specifications then speak to the GM manufacturer.
- Continue to support the collaborative RHS, industry and government transition to peat-free fellowship by responding to surveys, attending workshops, seminars and technical meetings and collaborating and sharing knowledge.

1. Introduction

1.1. The survey

The 'RHS Industrial Transition to Peat-Free Survey 2023' questions were drafted by the RHS transition to peat-free fellowship and circulated to the project partners, GM manufacturers, the Horticultural Trades Association (HTA) and the growing media task force for feedback. After assessing the feedback, the final questionnaire was completed and shared via the Survey Monkey platform.

In order to ensure a diverse representation of horticultural businesses, the survey conducted included a list of horticultural businesses obtained from various sources. These sources included the top 100 ornamental nurseries listed and published by Horticulture Week in 2023, the RHS Plant Finder directory, existing peat-free lists online, the RHS supply chain (retail and shows), the National Trust peat-free nurseries list, and contacts supplied by industry partners.

The survey was launched in February 2023 (open for 12 weeks) and was sent to 858 businesses. The survey questionnaire was distributed by email, and advertised on social media platforms, as well as the newsletters of the HTA, Fargro and several GM manufacturers, in order to include all identified horticultural businesses in the UK. Those in the survey that stated they were 100% peat-free were then also contacted by telephone to confirm that they had no peat in any of their business operations on site and were asked if they were happy to be listed online on the RHS peat-free hub as being 100% peat-free.

1.2. Survey sample

Out of 858 horticultural businesses 427 (50%) businesses completed the survey. Of these, 37% (n=159) were growing a broad range of plants, 50% (n=213) were specialist horticulture businesses (i.e. specialists in a particular type/group of the plants instead of growing a broad selection), 10% (n=43) were both specialist horticulture businesses and national plant collection holders and 3% (n=12) were national collection holders only.

The survey responses received provided a good representation of the industry - urban and rural and covered micro, small, medium and large horticultural businesses across the country see Figure 1.

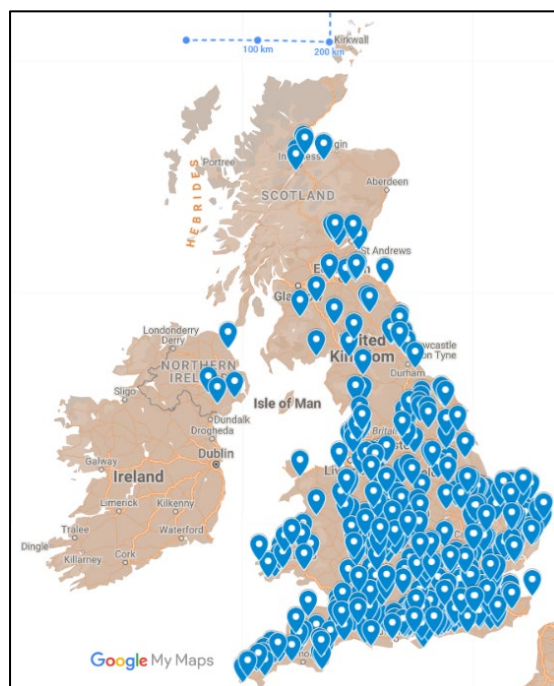


Figure 1. Distribution map of survey respondents by postcode.

2. Transition towards 100% peat-free horticulture

2.1. Peat-free status of UK horticultural businesses

From the 427 horticultural businesses that filled in the survey, 29% (n=124) grow peat-free and 17% (n= 73) grow 100% peat-free, including all propagation. The peat free list is shown in Appendix 1. Please note, 4% (n=15) of businesses stated they did not want to be listed on the RHS peat-free list.

2.2. Peat-free timeline: When horticultural businesses aim to be 100% peat-free

In the survey, horticultural businesses were asked about their timeline for becoming 100% peat-free in all operations, of which 87% (n=370) responded (Figure 2). Note that survey responses were collected prior to the Defra announcement of the 2026 peat ban with exemptions until 2030. Out of the 370 horticultural businesses, 51% (n=188) expected to be 100% peat-free in all operations by the end of 2026, 3% (n=10) expected to be 100% peat-free by the end of 2028, 2% (n=7) by the end of 2030, and 2% (n=6) after 2030. Furthermore, 2% (n=6) of horticultural businesses responded that they do not aim to participate in the transition to peat free. The remaining 40% (n=153) of businesses responded with "can't say as it depends on." Their transition depended on various factors including the availability of suitable peat-free products in terms of quality, consistency and performance, anticipated results from ongoing peat-free trials, costs and economics, peat-free status of incoming young materials/liners, and government legislation on the peat ban for the professional sector.

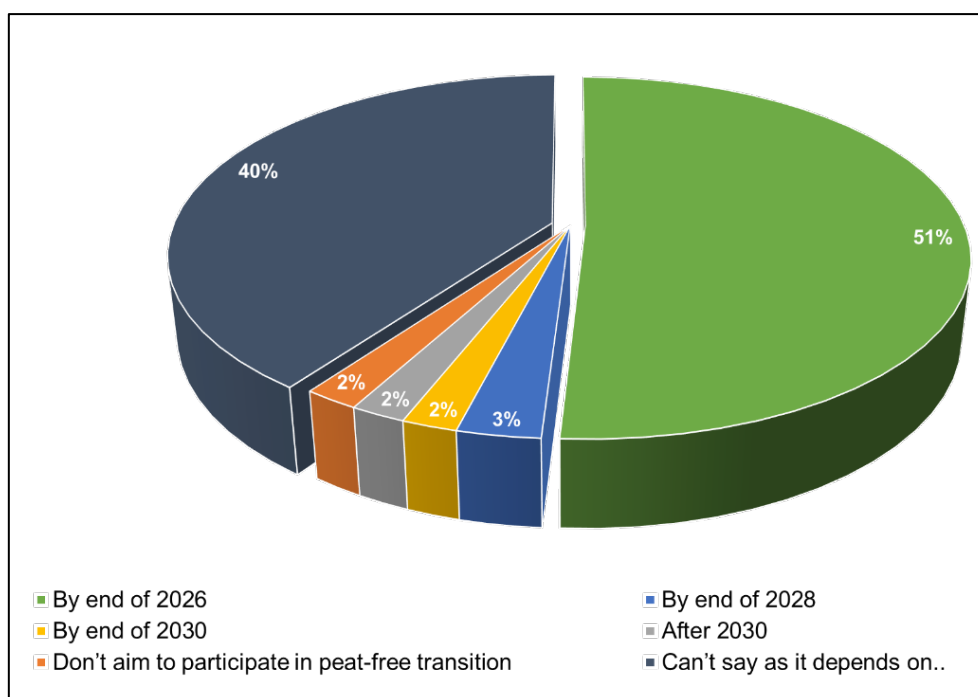


Figure 2. Percentage responses on the timeline of horticultural businesses aiming to be 100% peat-free in all operations (n=370)

2.3. Plug plant production status in UK horticultural businesses

In order to shed light on the status of plug plant production in the UK a question was included in the survey, 'Does your nursery produce plug plants?' To which 90% (n=383) of businesses surveyed responded. Of these 383, 74% (n=284) responded horticultural businesses were not plug plant producers and were sourcing plug plants/young plants from external sources or other businesses, the rest 26% (n=99) of 383 businesses were producing in-house plug plants or young plants. Of these 99 plug plant producers, 50% of their plug plants produced were in peat and 50% produced were in peat-free.

This data indicates that peat-free propagation is one of the key areas requiring scientific research and in-nursery demonstration of the success of peat-free young plant/plug production in a commercial setting undertaken. An RHS and Coventry University PhD is already set up to look at peat-free plug plant production and nursery trials are underway at industry grower sites as part of the RHS, Industry and Defra transition to peat-free fellowship.

A follow-up question aimed to understand how many horticultural businesses have requested their suppliers to supply them with 100% peat-free plugs/young plant materials, of which 94 businesses responded. As per the survey data, 64% (n=60) of these horticultural businesses had not asked to be supplied with any peat-free plug plants/young plants and 36% (n=34) of the horticultural businesses had requested 100% peat-free young plants from their plug/young plant suppliers. When asked for the reason from horticultural businesses (n=60) for not asking for peat-free plugs/young plants from their suppliers 20% responded 'Never thought to do this, as I am a small grower' and 14% responded that 'they will ask when there will be sufficient demand for 100% peat-free plants (including plugs) in the market'. Based on the above findings, it is recommended that businesses that have not requested 100% peat-free plug/young plants from their suppliers should ask their suppliers. If suppliers say no, then businesses should ask for the reasons as to why supplying peat free plug plants/young plants is not possible. This collective horticultural industry 'ask-consumer buying power' could help to influence those supplying plug plants nationally and internationally to provide horticultural businesses with 100% peat-free plug/young plant materials.

3. Availability of plant types from horticultural businesses

3.1. Plant types available from UK horticultural businesses

Based on 427 responses from horticultural businesses, The top five plant groups offered were 66% (n=281) herbaceous perennials, then shrubs at 49% (n=208), grasses at 44% (n=187), ferns at 41% (n=173) and trees at 33% (n=143). These were followed by climbers at 32% (n=135), bulbs at 31% (134), alpines at 31% (132), culinary herbs at 30% (127) and annuals and biennials at 26% (n=113) see Figure 3.

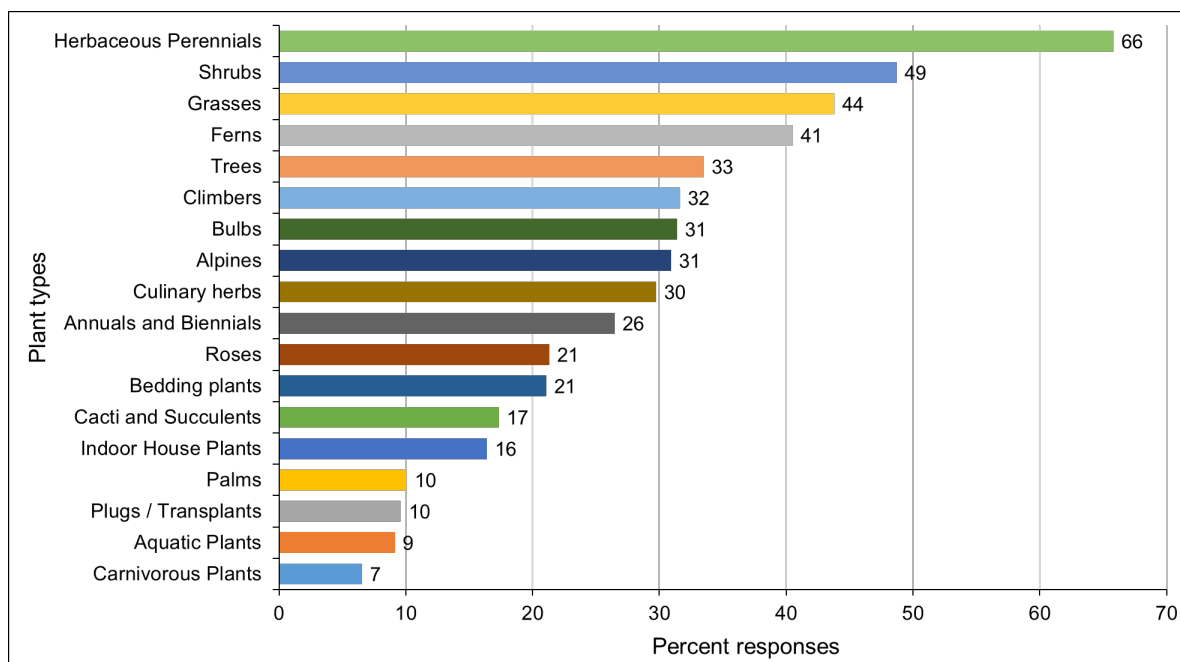


Figure 3. The extent of individual plant type representation across the 427 horticultural businesses that responded to the survey.

3.2. Peat free plant types available from UK horticultural businesses

Businesses growing 100% peat-free including all propagation (n=73), produce stock from across all different types of plants, with the exception of palms see Figure 4a. This demonstrates that transitioning to 100% peat-free, including plug/young material across a broad range of plant types is possible. According to the survey data, the most available 100% peat-free, including propagation offered are shown in Figure 4a.

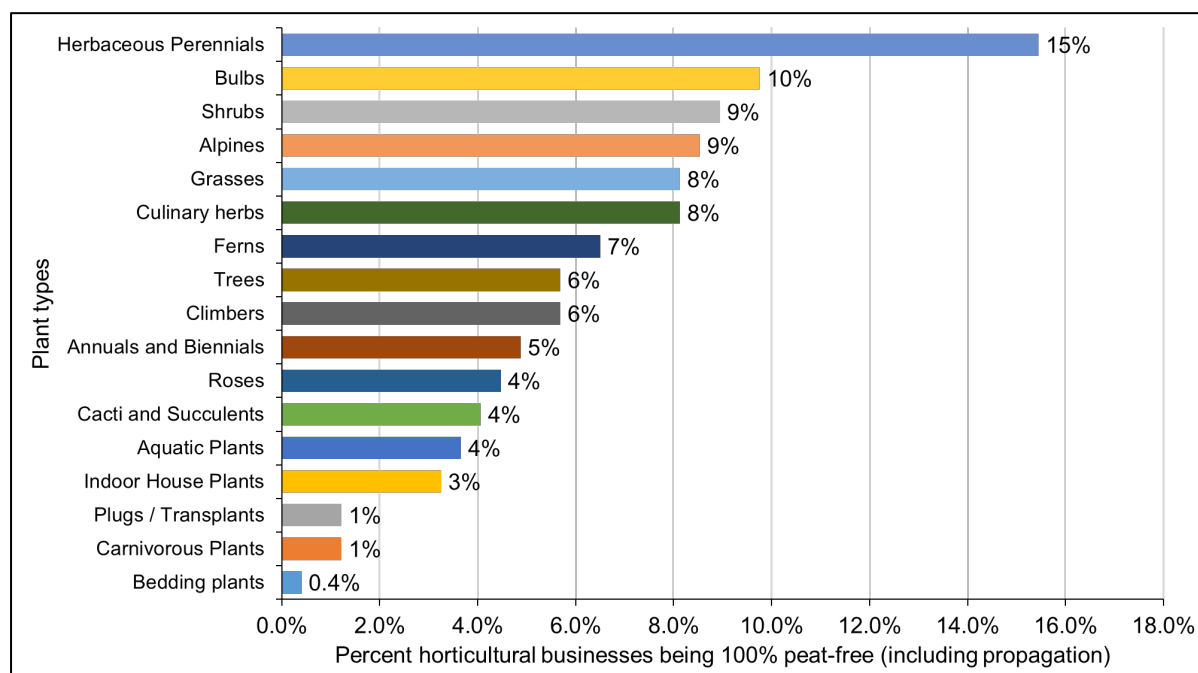


Figure 4a. Range of 100% peat-free plants, including propagation offered by businesses (n=73)

As per the survey data the most available peat-free grown plants, with the exception of propagation and incoming materials, produce stock from across all of the different types of plants offered by horticultural businesses as seen in Figure 4b.

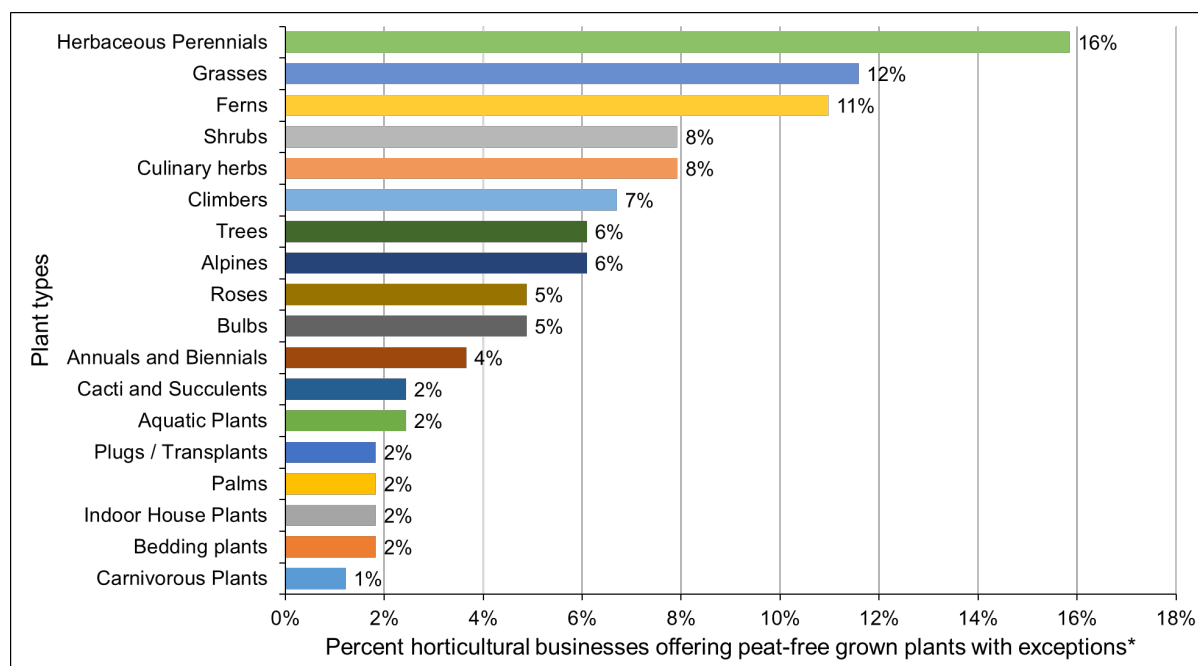


Figure 4b. Plant types offered by peat-free horticultural businesses with *exception in propagation/young plants/incoming liner materials (n=36)

3.3. Range of plants grown in peat, peat reduced, and peat free growing media

To establish a baseline for the use of different growing media (GM) for various plant groups, the survey asked participants the following questions: i) Which plant types do you grow in peat? ii) Which plant types do you grow in peat-reduced GM? iii) Which plant types do you grow peat-free? The horticulture businesses were able to select multiple plant types (as per <https://www.rhs.org.uk/plants/types>).

Of all businesses 96% (n=409) responded. For growing media use by horticultural businesses across individual plant types using peat, peat-reduced and peat-free growing media see Figure 5. To interpret Figure. 5, we provide an example using alpines e.g. this shows that of 78 horticulture businesses who grow alpines, 8% of GM used to grow alpines was in peat, 35% grow in peat-reduced GM and the rest 58% alpines grow in peat-free GM.

The use of peat as a growing media to grow different plant types was between 6% (for bulbs) to 25% (for carnivorous plants), while peat-reduced GM use ranged from 17% (to grow aquatic plants) to 59% (for bedding plants), and peat-free GM use to grow plant types ranged between 18% (for bedding plants) to 75% (for aquatic plants).

The results presented in Figure 5 show that the majority of horticulture businesses have already transitioned to peat-reduced GM to grow various plant types, with the top five being 59% (bedding plants), 49% (climbers), 43% (ferns), 43% (palms), and 43% (shrubs).

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The top five plant types being grown in peat-free GM are 75% (aquatic plants) 66% (culinary herbs), 65% (bulbs), 59% (cacti and succulents), and 58% (alpines). Followed by 57% (herbaceous perennials), 53% (indoor houseplants), and 50% (grasses). The three plant types with the lowest amount being grown peat-free were 18% (bedding plants), 38% (palms) and 41% (climbers).

Overall, results show that the majority of horticulture businesses across all plant ranges have already transitioned to peat-reduced growing media (GM) and that industry is using peat free GM to grow across all plant types (<https://www.rhs.org.uk/plants/types>). This data indicates a positive trend towards peat-free transition and reflects the industry's challenges and focus on the plant types, which need addressing to assist horticultural businesses to shift from predominantly peat-reduced growing to growing 100% peat-free.

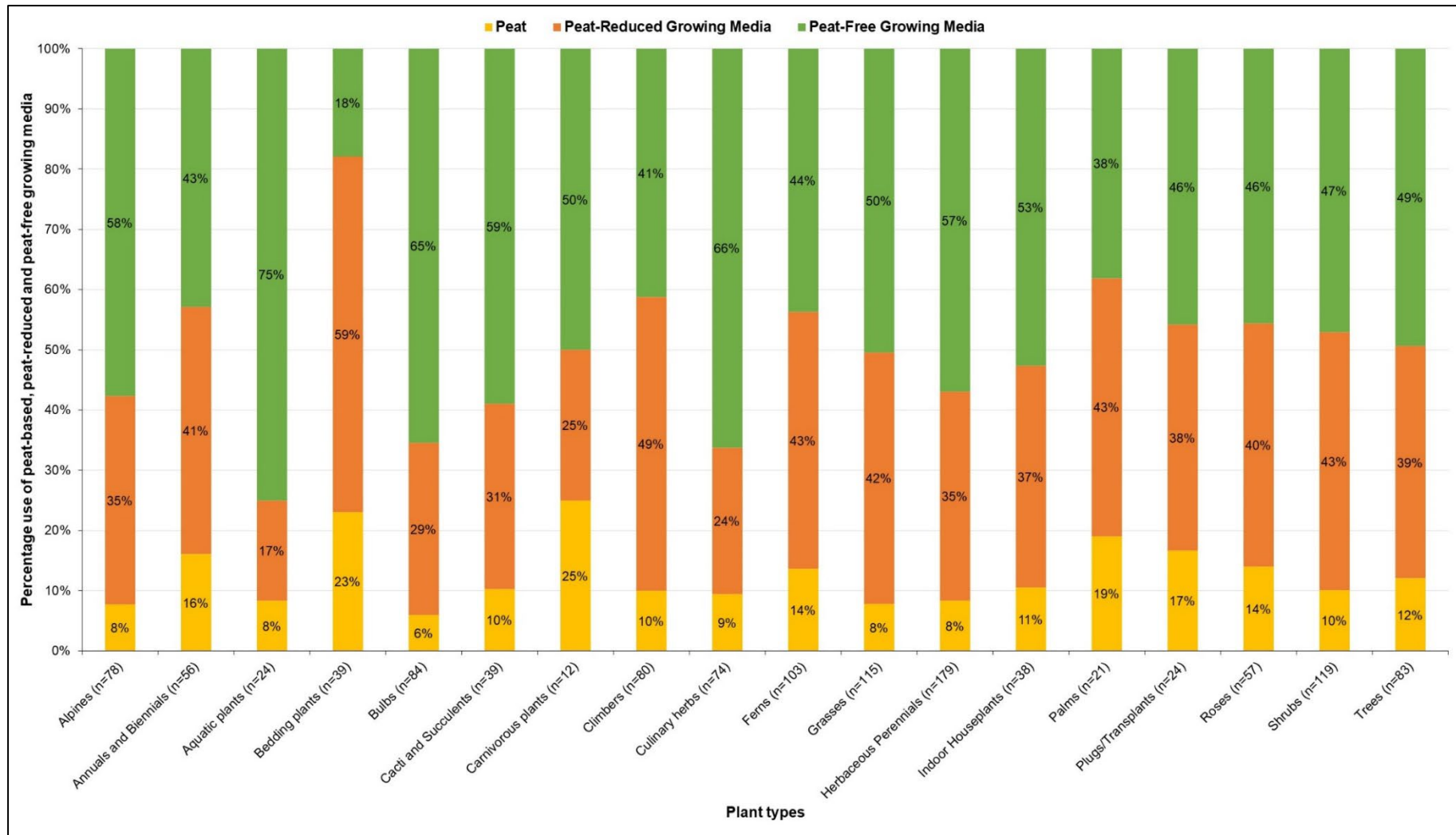


Figure 5. The distribution of plant types as per use of peat, peat-reduced and peat-free growing media (GM) according to the number of responses received in the survey. e.g. for Alpines of 78 horticulture businesses who grow alpines, 8% of GM used to grow alpines was in peat, 35% grow in peat-reduced GM and the rest, 58% alpines grow in peat-free GM

4. Estimated volume use of peat-free, peat-reduced and peat-based growing media (GM)

To determine the use of peat-free, peat-reduced, and peat-based GM mixes by horticultural businesses, as a percentage of total GM volumes used, growers were asked: "What is the estimated overall percentage of peat-free, peat-reduced, and peat mixes used in your nursery operations (as a percentage of total GM volumes used)?"

Of all 427 businesses 94% (n.403) answered this question, of these, 74% (n.297) were considered valid data (i.e. totalled 100% in terms of GM volume used by individual nurseries). On average, 60% of the total GM utilised was peat-free, 29% being peat-reduced and 11% being peat-based see Figure 6. The high percentage of peat-free and peat reduced GM in use indicates a positive step towards transitioning to 100% peat free.

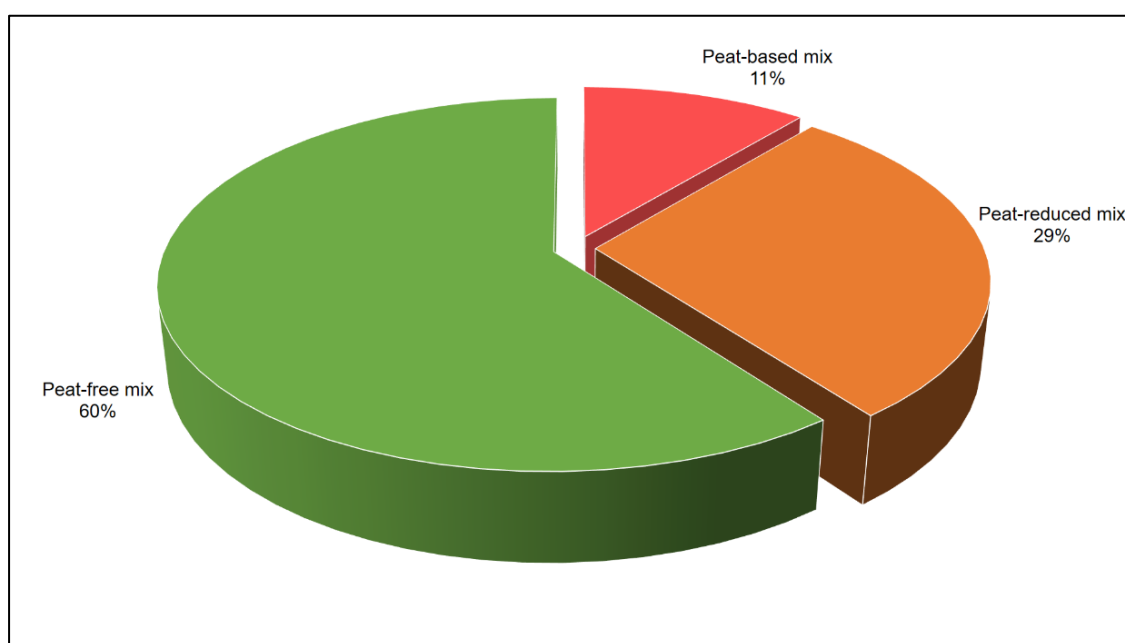


Figure 6. Percentage of peat-free, peat-reduced and peat-based mixes used in horticultural businesses (as % total GM volumes used; n = 297).

4.1. Peat-free mixes used by UK horticulture businesses

Survey results show that 68% (n=204) of respondents are using commercially available peat-free mixes, 20% (n=60) are using both commercially available peat-free mixes and preparing their own blend of peat-free mixes, and 12% (n=35) are formulating their own peat-free blends using raw materials from the nursery operations see Figure 7.

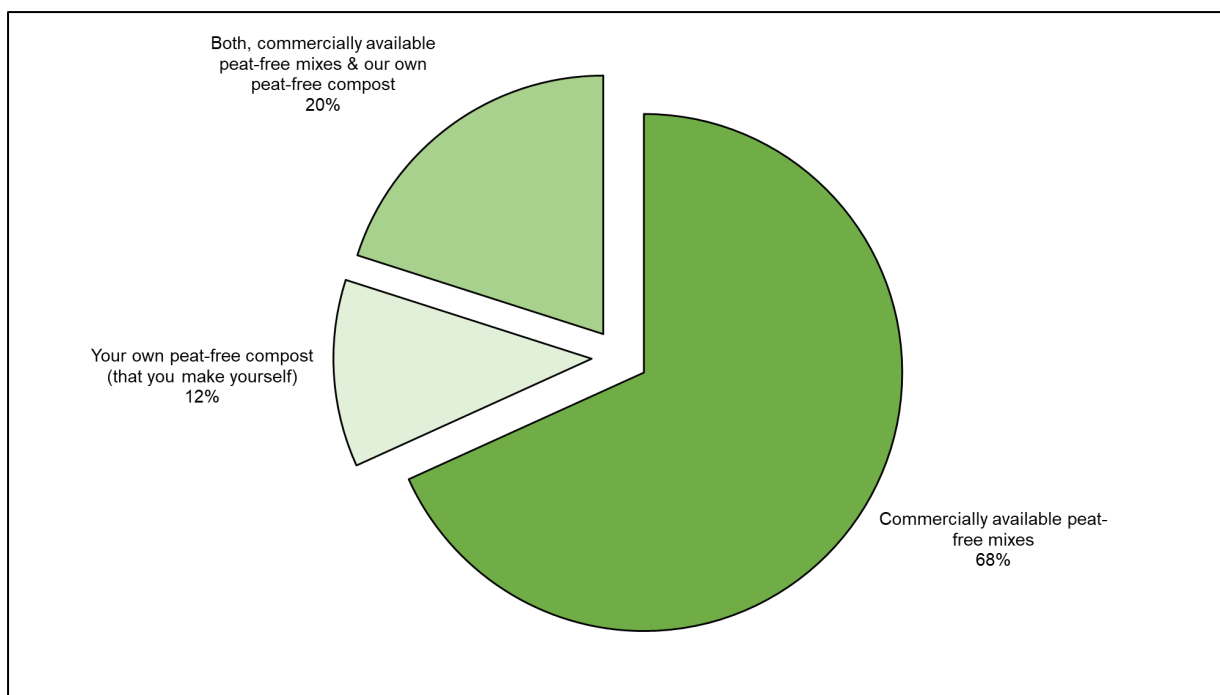


Figure 7. Percentage use of commercially available and own blend of peat-free mixes.

4.2. Peat-free growing media (GM) components

The results show that four major peat-free GM components are used by the UK horticultural businesses surveyed: bark, wood fibre, coir and composted green waste. In addition to this, perlite, vermiculite, loam, grit and sand are used to improve the physical structure, while nutritional supplements (mineral and organic) such as controlled release fertilisers (CRFs), anaerobic digestate and worm casted products are also being utilised.

4.3. Peat-free growing media (GM) brands used

The main peat-free GM brands used by UK horticulture businesses are listed alphabetically as follows: Bulrush, Dalefoot, Jiffy, Klasmann-Deilmann, Levington/ICL, Melcourt, Petersfield, Westland/Sinclair (n=334), while 55 responses mentioned use of other GM brands, listed alphabetically as follows: Caledonian Horticulture, Fertile Fibre, Gardenscape, House plant focus-growth technology, Lensli Substrates and van der Knapp.

4.4. Cost: Peat-free versus peat-reduced growing media (GM)

In response to the question, “On average how much does your nursery pay for commercial peat-reduced and peat-free mixes (in £ per m³)?” Of 427 businesses 26% (n109) responded. Out of these, 74 had missing data and were excluded from this cost analysis. Based on the remaining 35 data points, the cost difference calculated from peat-reduced to peat free GM per m³ increased in cost by 15-25%.

5. Supplementary ingredients used when handling peat-free mixes

Of 427 businesses, 65% (n=277) responded on what supplementary ingredients they use when handling peat-free mixes see Figure 8. Horticultural businesses were allowed to fill in multiple responses in terms of supplementary ingredients. The top three ingredients used by horticultural businesses are slow-release fertilisers accounting for 52% (n=143), controlled-release fertilisers with 42% (n=117) and liquid feeds with 42% (n=116). A total of 12% (n=34) indicated that they used none of the ingredients listed in the survey and 11% (n=31) of respondents mentioned they are using other ingredients with their peat-free mixes. These included anaerobic digestate, bark, bio char, grit, lime, loam, nematodes, organic fertilisers, perlite, sand, vermiculite, and worm casted products.

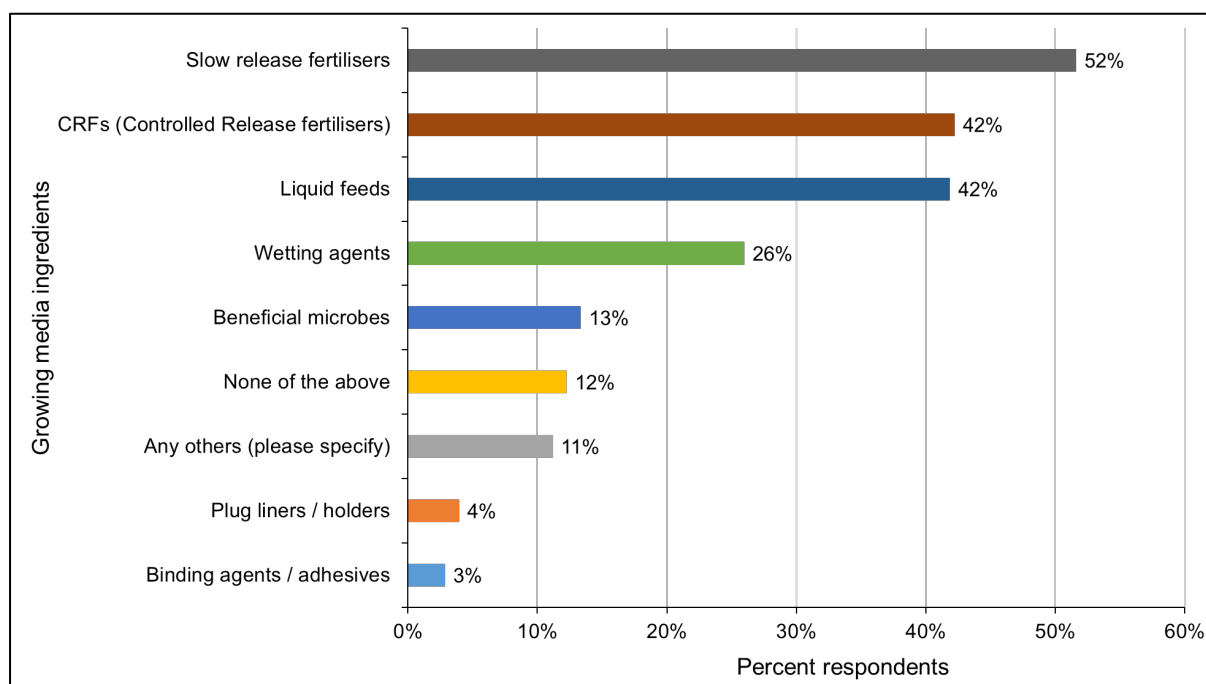


Figure 8. Use of supplementary ingredients when handling peat-free mixes (n=277).

6. Assistance to help industry transition to peat-free

When businesses were asked “What assistance do you need to help your transition to peat-free?” 87% (n=373) businesses responded. Of these 98 (18%) businesses would benefit from technical support on how to grow peat-free, 97 (17%) businesses would benefit from a knowledge/information hub for growers, 90 (16%) of respondents indicated that financial support/subsidies from the government would help to support their peat-free transition, 75 (13%) businesses asked for other forms of supported not listed in the survey. These other forms include i) the availability of a consistent product; ii) the availability of peat-free propagation/peat-free plug plants, peat-free liners and peat-free status of incoming materials; and iii) solutions for challenging plant groups. Fifty-four businesses (10%) indicated that training/workshops on peat-free growing would be helpful, while 49 (9%) indicated that technical assistance to set up trials at horticulture businesses would assist the businesses towards their peat-free transition. Forty-three (8%) of respondents expressed a need for financial support from the government towards necessary equipment and facilities to support their transition to peat-free growing, and 54 (10%) responded ‘none of the above’ in terms of support/assistance.

7. Technical support from the Royal Horticultural Society

When horticultural businesses were asked the question “If a technical person/expert from the RHS was available to visit your nursery and provide you with technical support on peat-free growing/cultivation, would you welcome this support?” Of the 427 horticulture businesses, 62% (n=266) responded. Of these, 42% (n=112) stated they would welcome technical support from the RHS, 25% (n=65) responded unsure about welcoming this technical help, 19% (n=51) indicated that they would not take up the offer, and the remaining 14% (n=38) indicated a need for different forms of support. This included online resources on peat-free, grower’s factsheets, technical reports, and technical assistance by email and newsletters. In response to this, as part of the transition to peat-free fellowship the RHS will work in collaboration with industry and government in organising grower’s workshops on key aspects of peat-free growing, seminars and networking opportunities for growers. The RHS and industry request additional funding from Defra for a RHS-based peat-free technician to support trials with growers and further financial support for knowledge transfer across the industry.

8. Challenges and advantages of growing peat-free

To understand the key challenges associated with peat-free growing participants were asked “What are the key challenges and disadvantages you face when using peat-free mixes? Please select all that apply.” Participants were also asked, “Have you come across any advantages/savings whilst growing peat-free? Please select all that apply”.

8.1. The top five challenges of growing peat-free

This survey aimed to gather information on the challenges associated with growing peat-free so that they can be addressed scientifically by the RHS Transition to Peat-Free Fellowship Project. Of all businesses, 65% (n=277) responded to the question on challenges (where multiple responses were allowed from each respondent). The top five reported challenges associated with peat-free growing/cultivation were irrigation management (55%, n=151), cost (42%, n=115), feeding/nutrition management (38%, n=106), slow plant growth (25%, n=69) and poor root growth (23%, n=63) see Figure 9a. These results highlight the need for more research to identify effective and efficient solutions around irrigation and nutrition management in peat-free growing in order to ensure a successful and sustainable peat-free transition. This is being addressed in the scientific research and growing trials being undertaken by the collaborative RHS transition to peat-free fellowship.

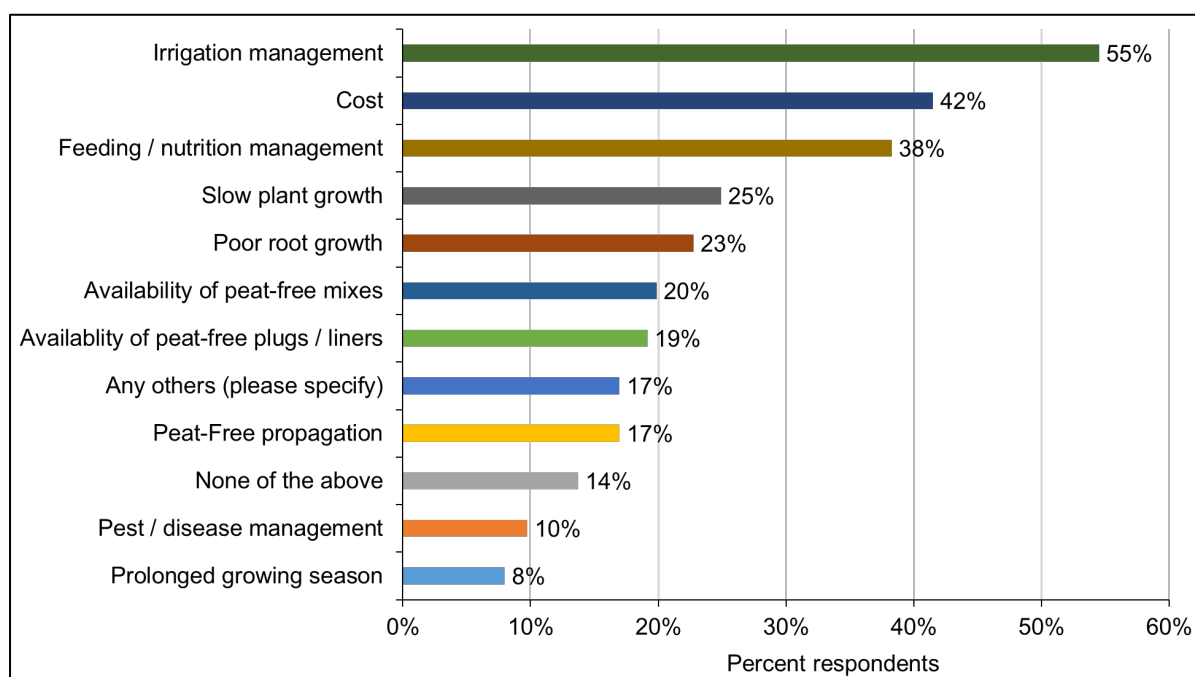


Figure 9a. Challenges of peat-free growing/cultivation (n = 277).

8.2. The top five advantages of growing peat-free

A total of 65% (n=277) of those participating in the survey responded to the question on advantages of growing peat free (where multiple responses were allowed from each respondent). The top five advantages associated with peat-free growing/cultivation were: reduced lichen growth on top of GM which saves time in dispatch and top-up materials (26%, n=72), a well-established root system (16%, n=44), less volume use of GM (16%, n=44), improved scope for beneficial microbial activity (10%, n=28), and improved control of root and aerial diseases (7%, n=20). Of survey respondents, 56% (n=155) reported that they did not see any of the advantages listed in the survey associated with peat-free growing (Figure 9b).

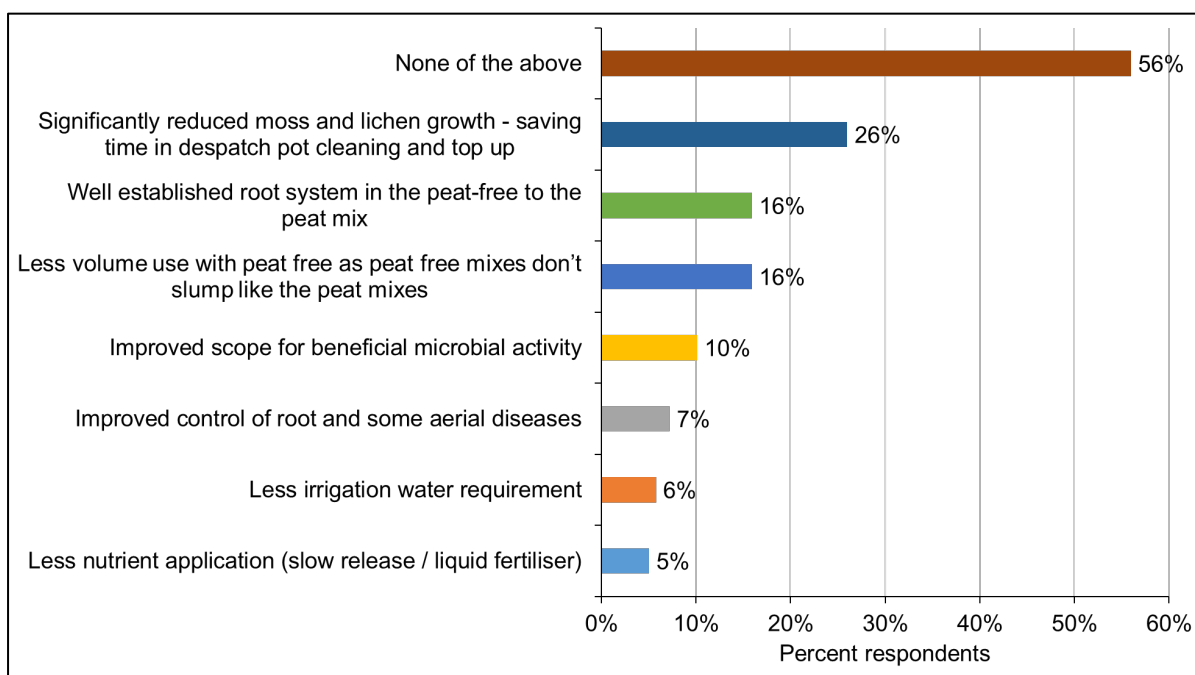


Figure 9b. Advantages of peat-free growing/cultivation (n = 277).

9. Estimated annual nursery-generated organic materials

Of all survey respondents 89.3% (n=381) answered. Of these, 42% (n=179) have an in-house composting facility to handle nursery generated organic waste materials, while 48% (n=202) do not have such a facility. Out of 179 horticultural businesses that have an in-house composting facility, 71% (n=128) were able to estimate the approximate value of the nursery-generated organic matter (as given in Table 1), while 29% (n=51) responded they could not estimate the volume generated annually see Table 1.

Table 1. Estimated volume of nursery-generated organic material per year

Approximate volume of compost produced/year	No. of responses	% responses
1-50 m ³	93	52%
51-100 m ³	18	10%
101-150 m ³	3	2%
151-200 m ³	4	2%
201-250 m ³	1	1%
251-300 m ³	0	0%
Greater than 300 m ³	9	5%
Don't know/can't estimate	51	28%

Based on the responses (Table 1) it is estimated that the 128 horticultural businesses can collectively generate a minimum of 4828 m³, a mean of 7897 m³, and a maximum of 11,100 m³ of organic material/compost per annum. This information is valuable for understanding the potential volume of organic waste material that could be repurposed into compost for sustainable horticultural practices. This volume of organic material has enormous potential for re-use in their or other businesses.

10. Continued support for the RHS, industry and government peat free fellowship

Of the 427 respondents 89% (n=379) responded that they will continue to support the RHS, industry and government transition to peat-free research and fellowship by doing follow-up surveys on their peat-free transition. This shows a positive will for the industry to transition to peat-free.

11. Survey conclusions and recommendations

This survey provides the first baseline data representing the status of 'peat-free' Transition across the whole of the UK horticultural industry. The peat free list can be seen in Appendix 1. From this survey, key recommendations and suggestions have been made for government and industry so that collectively we can achieve a sustainable transition to peat-free.

Acknowledgements

We would like to acknowledge the UK Government Department for Environment, Food and Rural Affairs (Defra) project ID C15718, the 'transition to peat-free' fellowship commercial nursery partners – Allensmore Nurseries, Hillier Nurseries, Hills Plants, Johnsons of Whixley, Lovania Nurseries, The Farplants Group, Vitacress and Volmary for funding support and other commercial partners including Fargro, HTA and GMA for their technical and support in-kind. We thank the National Trust for sharing their peat-free list. We thank the Royal Horticultural Society (RHS) for its financial support; we extend our gratitude to the RHS Horticultural Information and Advice team, Nicola Barker and the RHS peat-free campaign manager. We also thank RHS Sustainability Fellow and Wellbeing Fellow for assisting with the survey. We thank all horticulture businesses who participated in the RHS Industrial Peat-Free Survey 2023.

When referencing this report, please cite as follows:

Royal Horticultural Society (RHS). (2023). *Industrial Transition to Peat-Free Survey: 2023 Report*. [<https://www.rhs.org.uk/science/pdf/peat-free-survey-2023-report.pdf>].

Appendix 1: The 100% peat-free horticultural business list

Angharad Pike Gardener and Plants - [Angharad Pike – Gardener and plants](#) – Retail nursery selling herbaceous perennials in Hayling Island

Avon Bulbs - [Buy Flower Bulbs from Avon Bulbs](#) – bulbs for all seasons – online retail based in Somerset

Babylon Eco Centre - [Babylon Garden Centre - East Sussex](#) – bulbs and herbaceous perennials – retail nursery and garden centre in Ashdown Forest, East Sussex

Barnsdale Gardens - [Barnsdale Gardens](#) – alpines, bulbs, climbers, ferns, grasses, herbaceous perennials – retail nursery and gardens as well as online sales in Oakham, Rutland

Bluebell Cottage Nursery - [Bluebell Cottage Gardens and Nurseries, Cheshire, UK](#) – herbaceous perennials – retail nursery and online sales, in Dutton, Cheshire

Brockamin Plants - stone.brockamin@btinternet.com – alpines, aquatics, bulbs, ferns, herbaceous perennials – small nursery and National Collection holder with limited opening in Callow End, Worcestershire

Budlake Nursery - [Budlake Nursery - budlakenursery](#) – Japanese maple specialist – wholesale nursery in Tiverton, Devon

C & K Jones - [C & K Jones - International Rose Grower \(jonestherose.co.uk\)](#) – rose specialist – online sales based in Tarvin, Cheshire

Caley Bros - [Caley Brothers | Mushroom Grow Kits & Workshops in Sussex](#) – mushroom specialists – online sales with courses and events bases in West Sussex

Celtica Wildflowers - [Celtica Wildflowers | Perthshire Wildlife](#) – Scottish native wildflowers – online sales based in Wolfhill, Perth

Charleshurst Farm Nursery - [Charleshurst Farm Nursery \(charleshurstplants.co.uk\)](#) – alpines, climbers, herbaceous perennials, shrubs, trees – online sales and retail nursery (limited opening) based in Billingshurst, West Sussex

Cornwall Plants - [Cornwall Plants - Cornwall Plants Beautiful Plants for Sale.](#) – alpines, aquatics, seasonal bedding, bulbs, cacti and succulents, carnivorous plants, climbers, herbs, veg, ferns, grasses, herbaceous perennials, houseplants, roses, shrubs and trees – online sales

Coreside Nursery - [Home - Coreside Nursery Pembrokeshire - Buy Succulents Online UK plants by post peat free delivery organic Aeonium Echeveria Aloe Crassula House Plant order](#) – cacti and succulent specialist – online sales based in Pembrokeshire

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Crug Farm Plants - [Crûg Farm Nursery - Home \(crug-farm.co.uk\)](http://crug-farm.co.uk) – alpines, bulbs, climbers, ferns, grasses, herbaceous perennials, houseplants, shrubs and trees – online sales and retail nursery based in North Wales

Cumbria Wild Flowers - [UK Wildflowers and Plug Plants for Sale - Cumbria Wildflowers](#) – native wildflower specialist – online sales based in Cumbria

Earthed Up Ltd - [Earthed Up! – Edible and Useful Plant Nursery in Belper](#) – seasonal plants, herbs, veg, herbaceous perennials and shrubs – retail nursery based in Belper, Derbyshire

Edible Culture - [Peat pesticide plastic free garden centre & nursery | edibleculture](#) - bulbs, herbs, veg, herbaceous perennials, shrubs and trees – retail nursery based in Faversham, Kent

Edulis Nursery - [Specialist Plant Nursery - Growers of Rare Plants | Edulis](#) – alpines, bulbs, climbers, ferns, grasses, herbaceous perennials, shrubs – online sales and wholesale nursery, based in Pangbourne, Berkshire

Elworthy Cottage Plants - [Elworthy Cottage Plants Home Page \(elworthy-cottage.co.uk\)](http://elworthy-cottage.co.uk) – alpines, bulbs, ferns, grasses, herbaceous perennials – online sales and retail nursery based near Taunton, Somerset

Floralive - [Peat-Free Carnivorous Plants | FLORALIVE](#) – carnivorous plants – wholesale and online retail sales based in the Midlands

Fosters Exotic and Unusual Plants – cacti and succulents – sales through plant fairs and shows

Griselinia "R" Us - [Griselinia R Us | Griselinia hedging plants near Redruth, Cornwall](#) – Griselinia hedging cultivars – wholesale and online retail based in Redruth, Cornwall

Grow Wilder (Avon Wildlife Trust) - [Homepage | Avon Wildlife Trust](#) – wildflowers, herbs, aquatics and perennials – retail nursery and online sales based in Bristol

Growild Nursery - [Home \(growildnursery.co.uk\)](http://growildnursery.co.uk) – alpines, aquatics, seasonal plants, climbers, herbs, veg, ferns, grasses, herbaceous perennials and shrubs – online sales only based in East Ayrshire

Harriets Plants - [harriets plants](#) – houseplants – wholesale and online sales based in St Austell, Cornwall

Hogarth's Hostas - [Hogarth Hostas \(hogarth-hostas.co.uk\)](http://hogarth-hostas.co.uk) – National collection holder of small and miniature hostas – online sales only, based in Wokingham, Berkshire

Incredible Vegetables - [Incredible Vegetables - We grow perennial vegetables](#) – Perennial vegetables – online sales based in Ashburton, Devon

Jekka's - [Culinary herbs | Plants, seeds, herbal teas & experiences | Jekka's \(jekkas.com\)](#) – herbs – online sales based in Alveston, Bristol

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Jemima's Garden - [Flower Seeds for Wildlife - Get your garden buzzing.. \(jemimasgarden.co.uk\)](http://jemimasgarden.co.uk) – flower seeds for wildlife – online sales only based in Castle Douglas, Scotland

Jonathan Sheppard - [British Hollyhocks and Cosmos Bipinnatus – Adventures in establishing and looking after the National Plant Collections of both Alceas \(Hollyhocks\) and Cosmos Bipinnatus \(wordpress.com\)](http://wordpress.com) – National Collection holder of Hollyhocks and Cosmos bipinnatus – online seed sales only

Lincolnshire Pond Plants - [Homepage - Lincolnshire Pond Plants \(lincspplants.co.uk\)](http://lincspplants.co.uk) – aquatic plants – nursery collection by appointment and online sales based in Market Rasen, Lincolnshire

Marchants Hardy Plants - [Marchants Hardy Plants - Herbaceous Perennials & Ornamental Grasses](http://marchants.com) – alpines, seasonal plants, bulbs, herbs, veg, grasses, herbaceous perennials and shrubs – retail nursery based in Laughton, East Sussex

Meadow View - [Creating a new garden a Meadow View \(meadowviewplants.co.uk\)](http://meadowviewplants.co.uk) – herbaceous perennials – Plants sold at Mere Sands Wood Wildlife Trust Reserve, near Rufford, Lancashire

Merriments Gardens - [Merriments Gardens - Garden · Plants · Shop · Restaurant](http://merriments.com) – alpines, seasonal plants, bulbs, cacti and succulents, climbers, herbs, veg, grasses, ferns, herbaceous perennials, houseplants, roses and shrubs – Retail nursery and gardens based in Hurst Green, East Sussex

Micklefield Hostas - [Micklefield Hostas: the largest National Collection of Hosta in the UK](http://micklefield.com) – hosta specialist and national collection holder – retail nursery and online sales based in Stowmarket, Suffolk

Mieri Eco Farm - [Mieri Eco Farm Official Blog](http://mieri.com) – native climbers, ferns, shrubs and trees – online sales or collect orders from the nursery based in Carmarthenshire

Miles Japanese Maples - [Miles Japanese Maples – Growing beautiful trees](http://miles.com) – Japanese maples – online sales or collection from the nursery based in Storrington, West Sussex

Morlas Plants Ltd - [Morlas Plants – Mail Order Rare Snowdrops, Erythroniums, Bulbs and Plants from Shropshire](http://morlas.com) – bulbs, ferns, grasses and herbaceous perennials – online sales based in Oswestry, Shropshire

New Hope Daylilies - [New hope Daylilies | British Daylily Nursery | Nestled in the beautiful South Shropshire Hills](http://newhope.com) – Hemerocallis (daylilies) specialist – online sales only based in Colebatch, Shropshire

New Wood Trees - [New Wood Trees - British Grown Multi-stem Trees](http://newwood.com) – multi-stem tree specialist – wholesale nursery (visits by appointment) based in Totnes, Devon

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Northern Ark Nursery – alpines, seasonal plants, bulbs, herbs, veg, herbaceous perennials and shrubs – wholesale and retail nursery based in Morpeth, Northumberland

Old Court Nurseries - [Old Court Nurseries and The Picton Garden - Specialist growers of Autumn flowering Asters since 1906 \(autumnasters.co.uk\)](#) – Seasonal plants, bulbs, cacti and succulents, carnivorous plants, ferns, grasses, and herbaceous perennials – Retail nursery, gardens and National Collection holder based in Colwall, Herefordshire

Pennard Plants - [Pennard Plants, Heritage Vegetable and flower Seeds, Edible plants and Agapanthus](#) – herbs and veg – online sales only based in East Pennard, Somerset

Perennial Café and Gardens - [Perennial St Davids :: Home](#) – Herbs, veg, ferns, grasses and herbaceous perennials – Retail nursery and gardens based in St David's, Pembrokeshire

Polemonium Plantery - [Polemonium Plantery 01429 881529](#) – alpines, seasonal plants, bulbs, herbs, veg, grasses, herbaceous perennials and shrubs - retail nursery and National Collection holder, open on Sundays and online sales based in County Durham

Pondfolk - [Pondfolk Ltd - Pond & Wetland Plants](#) – Aquatics and bulbs – small retail nursery based in Topcroft, Norfolk

Potash Nursery - [Potash Nursery Ltd.](#) – Fuchsias and Pelargoniums – retail nursery, online sales based in Stowmarket, Suffolk

Roseland House Nursery – [ROSELAND HOUSE GARDEN & NURSERY](#) - Climbers and roses – Nursery and National collection holder, online sales based in Truro

Saith Ffynnon Wildlife Plants - [Wildlife Plants | Seeds | Saith Ffynnon Wildlife Plants \(7wells.co.uk\)](#) – Wildlife friendly aquatics, seasonal plants, cacti and succulents, herbaceous perennials, houseplants, plugs and transplants and shrubs – Nursery and National Collection holder, online sales based in Holywell, Flintshire

Seagate Nurseries - [Home | Seagate Nurseries | Lincolnshire | Irises | Perennials |](#) - Alpines, bulbs and herbaceous perennials, Bearded Iris specialist – retail nursery and online sales based in Long Sutton, Lincolnshire

Southwold Succulent Company - [Southwold Succulent Co - Home](#) – Alpines, cacti and succulents – online sales only based in Suffolk

St Andrews Botanic Garden - [St Andrews Botanic Garden - Home Page](#)- Alpines, climbers, grasses, herbaceous perennials, shrubs and trees – Botanic Garden and retail nursery based in St Andrews, Fife

Summerdale Garden Nursery - [The new home for Summerdale Garden Nursery](#) – Alpines, ferns, herbaceous perennials and Primula auricula specialist – retail nursery and online sales based in Lupton, Cumbria

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Sunnybank Vine Nursery - [specialist vine nursery \(sunnybankvines.co.uk\)](https://sunnybankvines.co.uk) – National Collection of Vines – seasonal online sales only based in Herefordshire

Sunnyview Flowers - [Cheshire Florist | Sunnyview Flowers | Crewe, Nantwich, British Flowers](#) – cut flowers for florists – online sales based in Nantwich, Cheshire

Surreal Succulents - [Welcome to Surreal Succulents - Surreal Succulents](#) – Cacti and succulents – retail nursery and online sales based in Gulval, Cornwall

Tan-y-Llyn Nurseries - [Tanyllyn Home \(tanyllyn-nursery.co.uk\)](https://tanyllyn-nursery.co.uk) – herbs and herbaceous perennials – retail nursery only based in Montgomeryshire

The Backyard Larder - [Welcome to The Backyard Larder - The Backyard Larder](#) – bulbs, climbers, herbs and veg and specialising in perennial veg – online sales only

The Coastal Gardener - [The Coastal Gardener, St Helens Isle of Wight Plant nursery, Display beds](#) – Coastal plant specialists, cacti and succulents, climbers, herbs and veg, ferns, grasses, herbaceous perennials, palms, shrubs and trees – retail nursery based in the Isle of Wight

The English Iris Company - [Exclusive British Bearded Irises - The English Iris Company](#) – National collection holder and Iris specialist – online sales only based in Norfolk

The Humble Bee Gardeners - [Home - Humble Bee \(humblebeegardeners.co.uk\)](https://humblebeegardeners.co.uk) – Alpines, herbs and veg, ferns, grasses, herbaceous perennials, plugs and transplants, roses and shrubs – Retail nursery open by appointment only

The Little Green Plant Factory - [The Little Green Plant Factory - Organically grown plants from Yorkshire](#) – Alpines, bulbs, climbers, herbs and veg, grasses, herbaceous perennials, roses, shrubs and trees – online sales based in Woodmansey, Yorkshire

The Mother Tree - [About Us – The Mother Tree](#) – Shrubs and trees specialising in edible fruit and nut plants – Retail and wholesale nursery mainly online sales, based in Dartington, Devon

The Plantsman's Preference - [The Plantsman's Preference - The Plantsman's Preference \(plantpref.co.uk\)](#) – Alpines, bulbs, grasses, herbaceous perennials and shrubs – Retail nursery and online sales based in South Lopham, Norfolk

The Wildflower Nursery - [Plug Plants | The Wildflower Nursery | Wales](#) – Plugs and transplants of native plants – online sales only based in Pembrokeshire

Tissington Nursery - [Home | tissington-nursery](#) – Bulbs, herbs and veg, grasses and herbaceous perennials – retail nursery based in Tissington, Derbyshire

Tom Adams Fruit Tree Nursery - [Home - Tom The Apple Man](#) – Organic Fruit tree specialist – online sales based in Shropshire

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Tradescantia Hub - [Tradescantia Hub • Cultivar research and information](#) – Tradescantia specialist and National Collection holder – online sales or collection only based in Machynlleth, Powys

Trecanna Nursery - [Crocoshia from Trecanna Nursery - UK](#) – Bulbs and herbaceous perennials specialising in Crocoshia – online sales only based in Chilsworthy, Cornwall

Trevor White Roses - [Trevor White Roses | Old Roses Grower | Quality Mail-Order Roses](#) – Rose specialist – online sales only based in Norfolk

Ward Alpines – Alpines – wholesale only based in Devon

Water Garden Plants - [Home Page - Water Garden Plants](#) – Aquatic and bog garden plants – Retail nursery, online sales only based in Norfolk

West Wales Willows - [West Wales Willows – Justine Burgess: Willow artist, grower and tutor](#) – Willows only – National collection holder, online sales and nursery open days, based in Carmarthen