

Commercial harvesting of peat in Cumbria.

Aerial view of commercial-scale peat extraction at Bolton Fell Moss, Cumbria (operations set to cease here in Nov 2013).

LEFT TOP RIGHT: RHS / RACHAEL TANNER SCIENCE PHOTO LIBRARY RHS / PAUL ALEXANDER

RHS science update

REPLACING PEAT

With the Government aiming for the elimination of peat from growing media, how will gardeners and the horticultural industry cope with the alternatives?

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Peat has become a hot topic in UK horticulture. Since the 1940s it has been the main ingredient of choice for growing media (or 'potting composts'). Before then, loam-based John Innes formulations were the norm. Ingredients are chosen mainly for their performance (how well plants grow in them), their availability and the costs of transporting them.

Peat's popularity in the UK has been based on its cheapness, and its chemical and physical consistency. It requires relatively little processing once harvested to form a growing medium, and is locally available to the UK from within Europe. The chemical and physical properties of peat are well suited to its use in growing media. It is physically stable

and low in fertility, so manufacturers can add different blends of nutrients to tailor their growing media to particular plant types. However, even peat benefits from the addition of other materials to improve its properties – composted bark, for example, is often added to improve a mix's drainage properties.

So if peat is cheap, available and ideal, why is it being phased out?

Peat and environment

The impacts of peat extraction are often debated. Cases can be made to support, and contradict, most issues. What is not in doubt is that pristine peatlands are increasingly rare habitats supporting uncommon and specialist plants and animals in diversity. They aid freshwater management by helping mitigate

flooding, and many preserve valuable archaeological archives.

There is also debate over peatlands and climate change, and whether they store or release greenhouse gases. The precise balance is complex and often specific to particular sites, but most researchers agree that peatlands as a whole store carbon.

Living peatland vegetation absorbs carbon dioxide from the atmosphere. When it dies under waterlogged conditions the process of peat formation begins, which locks up more carbon than it releases. When we harvest peat and take it from the wet, low-oxygen conditions in which it formed and persists, it begins to break down and releases this stored carbon. Primarily, this is as carbon dioxide, an important greenhouse gas linked to climate change. »

The vegetation of areas from which peat has been harvested can regenerate, but this may be a slow process.

For most purposes, RHS Garden Wisley uses a commercial peat-free product.

The new generation of growing media

When buying growing media, the gardeners' predicament is not knowing how they may perform. Feedback from the RHS Members' Advisory Service suggests that the performance of many **peat-based**, **peat-reduced** and **peat-free** growing media is variable. Some of this may be related to manufacturers trying to reduce costs by sourcing cheaper ingredients, reducing the quality of the final product.

One idea from the industry is a 'quality standard'. This could be expensive to adhere to and administer, but should allow gardeners to make a more confident choice (quality standards are already in use in the Netherlands and in Australia). Currently, labelling of products in the UK is at best variable – some packaging includes content details, others do not even say whether the material is peat-based or peat-free. Some manufacturers argue that consumers interpret the label 'peat-free' as meaning the product is lacking in something, so do not use this description for fear of negative connotations.

Difficulties in the marketplace

Good quality peat-reduced and peat-free alternatives for the bulk of general gardening tasks are now available, but competition is forcing prices down, making it difficult for them to compete with established peat-based formulations. A recent RHS survey suggested that consumers remain price driven when buying growing media. RHS Garden Wisley uses a commercial peat-free product that is more expensive than comparable 'off the shelf' products, because it is of an assured quality.

International research

In parts of the USA and Australia peat is an expensive ingredient (due primarily to transport costs), so has not commonly been used in growing media. Wood-based materials such as composted bark (right) have dominated growing media in these areas.

Increasingly, international research is looking into materials that are sustainable, and ideally considered to be waste. North American research focuses on various wood wastes, making use of different tree species, different portions of the tree (such as bark or needles) or designing mixes by particle size (coarse materials mixed with finer particles).

In Spain, recent research has trialled composted gorse as a growing-media ingredient – not only sourcing materials locally, but finding a use for a 'problem' (invasive) plant. Other materials being studied as potential constituents for growing media include cotton gin 'trash' (the waste from cotton fibre production), olive waste, rice hulls, carpet waste and brewery waste.

Sourcing peat

We are using huge quantities of peat. In 2010, UK horticulture used nearly 3 million cu m (106 million cu ft) of peat, almost 70 percent of this by home gardeners. Currently, 60 percent of the annual total is imported from the Republic of Ireland, 32 percent is from within the UK and 8 percent from northern Europe.

As an industry, commercial horticulture in the UK recognises that it must reduce its environmental impact and improve its sustainability. Much UK peat comes not from uplands but lowland raised bogs: these now extremely rare, specialist ecosystems support a diversity of rare plants and animals.

Figures based on global peat reserves suggest that considerable volumes of peat are available worldwide. This may well be true, but the cost of extracting and shipping make most reserves too expensive: they are simply too far from the markets and consumers.

Alternative materials

Any material used in growing media has to satisfy the chemical and physical qualities of peat, but must also be: commercially available at suitable volumes; available year round; consistent; free of contaminants; and ideally need little

Government view on peat

The recent Government white paper, 'The Natural Choice', announced its aim of - voluntarily - eliminating peat use in horticulture by 2020 for home gardeners and by 2030 for professionals. To achieve this, a cross-industry task force of growers, manufacturers, non-governmental organisations and retailers was set up.

The Sustainable Growing Media Task Force aims to identify the barriers that have held back peat replacement to date, and to suggest how these can be overcome. In June this year it will publish its recommendations towards a voluntary phase-out.



Trials of peat-reduced and peat-free growing media at RHS Garden Wisley.

RHS/PAUL ALEXANDER

processing. Many alternatives to peat fail to meet some of these criteria (and often cost more than peat).

Peat has been so successful in multi-purpose compost that replacing it is challenging. Because no single material satisfies all the requirements, most new growing media are blends of one or more main ingredients and a number of others at smaller volumes. For peat-free products, we may need to return to different media formulated for specific groups of plants. Developing and trialling new media is costly and time consuming. Balancing the chemical and physical properties of naturally variable organic materials, ensuring they are ideal for the end use, and that the product is stable to allow some storage, is so complex it can take three or more years before a product is ready to market.

In the UK, growing media ingredients now include green-waste compost, composted bark, wood fibre and coir. Research continues into how they are best blended to produce reliable, consistent growing media. Other studies (see panel, p69) are looking at 'designing' growing media from specific materials, such

'Commercial extraction of peat at current rates is unsustainable'

as food-waste compost or coarser woody materials.

Many growers, both professional and home gardeners, regularly report they need to alter their management practices with the newer ingredients. Watering, feeding, and pest and disease management can all vary with growing media made from different materials. The Society's own studies and trials will continue and the results publicised in *The Garden* and elsewhere as a priority. ●

www.rhs.org.uk/peat For more information on peat use, the RHS policy on peat, and alternative media, visit the pages at RHS Online.

❖ **Growing media buying habits** For results of the June 2011 RHS survey see *The Plantsman*, March 2012.

Europe and trade

The desire to replace peat not only affects the import of material for bags of growing media, but also impacts on professional plant growers.

An unfortunate side effect of replacing peat in the UK is that our own professional growers must compete with European growers who face less pressure to reduce their peat use.

It is widely believed that growing peat-free is more expensive, so UK growers may not be able to compete on price with imported plants grown in Europe. This issue is something that the industry and the Department for Environment, Food and Rural Affairs (DEFRA) wish to prevent happening.

Impact on growers

A number of professional growers are peat-free, some have peat-free lines, some have peat-reduced lines and nearly all will have tried peat-free growing at some stage. The issue of increased costs, due to changes in management practices for example, are cited as currently preventing most growers increasing their use of peat-free media. It is hoped that over time, as growers get used to new blends, this will change.



RHS/RACHAEL TANNER



Scoring petunia plants at the end of the trial.

RHS/PAUL ALEXANDER

VIEW FROM Roger Williams, RHS Head of Science



RHS/NEIL HEPWORTH

The RHS is acutely conscious of the adverse environmental impacts of the use of peat in horticulture, and how important it is to support the nation's gardeners and horticultural industry in reducing peat use. That is why we are pleased to be contributing to DEFRA's

Sustainable Growing Media Task Force.

Thanks to the efforts of RHS curatorial staff and scientists, our own gardens are now 97 percent peat free. We only use peat-based media to propagate certain plants and to maintain a small number of our specialist plant collections. Peat is never used as a soil improver or mulch in RHS Gardens, and at our flower shows we have banned the use of peat for staging exhibits.

We have taken these steps because we think commercial extraction of peat at current rates is environmentally unsustainable, as it removes peat at a much faster rate than it forms, leading to the irreversible destruction of peatlands. This matters because, worldwide, peatlands are important for biodiversity, carbon storage and flood risk management.

Quality control

We are committed to informing, encouraging and helping gardeners to use peat-free alternatives but, in our experience, the variable quality of peat-reduced and peat-free growing media are of concern to gardeners. Consumer confidence is critical and needs to be improved by better quality control of such media. Information about which peat-free products are appropriate for specific applications and plants is often lacking at the point of sale. The Society believes that labelling of growing media needs to be improved. Packaging should be explicit about its peat content and all other ingredients in the mix.

More work needed

Addressing such issues would help gardeners make better-informed choices, and enable the RHS further to improve its advice to gardeners on how best to manage the increasing number of types and mixes of growing media.

For example, we have examined how plants grown in different peat-free media respond to different watering regimes (see *The Garden*, Jan 2011, pp51-56). The results suggest that good plants can be grown in a wide range of media but, with some mixes, watering must be managed carefully for best results. This RHS research is continuing, examining other factors such as different methods of irrigation, the response of different plant types, and trialling more peat-free substrate mixes.

Finally, we see a need for further research where peat replacement is considered most difficult - for ericaceous plants, the propagation of vegetables, and the supply of fresh herbs to supermarkets by commercial growers.

RHS/TIM SANDALL

