Container Growing Media in the UK: Balancing the Needs of Horticulture and Conservation

Peat has been the main material used in growing media, or "compost", for over 30 years. However environmental concerns surrounding its extraction have recently led to a change in attitudes about its continued use.

Although there are around 1.65 million hectares of peat soils in Great Britain, mostly greater than 1m deep, only 70,000ha are lowland raised bogs, the type having potential commercial interest for horticultural peat. Yet of this, little remains recognisable as lowland raised bog, with only 3,836ha in a near natural condition and 5,032ha degraded or drained but capable of regeneration. Accordingly, the UK Government has established targets to limit the use of peat in horticulture. The 2005 target of 40% peat replacement has been met but, as 2010 approaches, the target of 90% peat-free across growing media and soil conditioners appears increasingly out of reach. One recent industry-wide initiative has seen UK horticulture look forward and take positive steps towards meeting this challenging target.

Early Developments in Growing Media

The terms growing media, compost and potting mix are all used interchangeably to describe the material that growers use to fill pots and trays in order to raise and grow plants. The primary requirements of the material are to provide anchorage for the plant while balancing air and water provision in the rooting zone. Commercially, the material also needs to be available in large volumes and to be of consistent quality.

In the 1930s Lawrence and Newel developed what are known as the "John Innes" mixes, which were the first commercially available standardised growing media in the UK. Made from blends of "loam" (composted grass turves), peat and sand, these mixes were slowly accepted by the industry over a 10-15 year period. Loam is not an ideal constituent of growing media, however, as it is heavy, making transport and handling more expensive; and sourcing large volumes of good-quality loam is difficult. Replacing the loam with peat in the 1970s solved both of these problems. As with the "John Innes" mixes, the peat-based mixes took a number of years to be accepted as growers had to alter their systems to accommodate the "new" material.

Peat has many properties that make it an ideal constituent of growing media, being generally low in nutrients and having low pH, low bulk density and a good air-filled porosity value. Many growers have become conditioned to using peat and there is a myth that there is nothing like peat and that it is one consistent material. However, peat is a very variable material. Each peat type has a unique set of properties and these affect how it will perform in growing media. The suggestion of a "generic" peat being a panacea is ill-founded, as is the suggestion that peat can be replaced with one material.

Increasing Environmental Awareness

In the late 1980s concerns over the use of peat in horticulture in the UK arose from the damage it caused to natural habitats and the archaeological artefacts preserved within the peat body, as well as the detrimental effects it had on the hydrological cycle. For the environmental lobby, the debate grew into a broader one of wider environmental responsibility. They believed it to be both illogical and immoral to export the UK's environmental footprint to other countries by importing their peat.

The sustainability of peat use is of particular concern. Peat bogs can take up to six years to prepare for commercial extraction. Vegetation is cleared and the site drained (which also affects the surrounding landscape) prior to milling. Commercial operations can remove depths of up to 22.5cm per annum but peat only forms at approximately 1mm per annum. Within any biogeographical area, this is widely regarded as unsustainable. Some industry interests have, however, widely promoted UK peat use in terms of overall global peat formation, ignoring the specific biodiversity and archaeological interests of biogeographic regions, let alone the issue of whether extraction from all bogs is economically viable. There is now a much better understanding and an acceptance of the need for sustainability to be assessed with more sophistication than at the global level.

Restoration to raised bog cannot be taken for granted as this after-use in some cases is not a requirement of the original planning permission. Some "restored" bogs have been turned into amenity wetland sites (e.g. in Somerset and Ireland) and these do not substitute for the original fully functioning peat bog in terms of its nature conservation resource and biodiversity and, of course, its archaeological and palaeo-ecological archive will have been destroyed.

The Peat Debate in Horticulture

In 1990 a UK peat-free campaign began with calls to ban the use of peat and stop all peat extraction. Public awareness was raised with a bold and clear message but the uncompromising call to "ban peat" increased anger and defensiveness within the horticultural industry. The prospect of peat replacement was seen by some as unrealistic, a view exacerbated by the scarcity of good-quality peat-free alternatives at that time. The opposing positions became entrenched. The "peat debate" flared and raged for much of the 1990s with feelings running high on both sides.

In response to the debate the UK Government set up a Peat Working Group. In 1994, this made a variety of recommendations which attempted to balance the needs and interests of conservation and the horticultural industry. Through its Biodiversity Action Plan (BAP) the UK Government introduced a target for 40% of growing media and soil improvers to be of non-peat materials by 2005. This Habitat Action Plan (HAP) target reflected the issues of conservation, sustainability and peat extraction in the UK and has informally recognised the desire not to export the UK's environmental footprint by curtailing domestic peat extraction. The HAP built on the initial target, by including a second target for the use of alternatives to be 90% non-peat by 2010.

Growing media manufacturers began to recognise the problems and investigate peat replacement. Up until now, research into alternative materials had focussed on using the advantageous properties of these materials in small quantities to improve the quality of the peat-based growing media. However, investment in new technology and a greater knowledge and understanding of the materials, improved the results of plant-growing trials. By the late 1990s, although many of the peat-free and peat-reduced growing media trials were proving very successful, commercial uptake was limited.

Industry-Wide Agreement

Despite the Government targets, factors such as conflicts of interest, technical problems, increasing costs, reluctance and apathy saw slower progress towards achieving the 90% target by 2010.

In 2004, a small group was formed to discuss the potential for encouraging a greater take-up of peat alternatives. This group has subsequently grown to include key Non-Government Organisations (NGOs), retailers (big and small), growing media manufacturers, growers and the Department of Environment, Food and Rural Affairs (Defra). In spring 2008, the group launched the Growing Media Initiative (GMI), managed by the Horticultural Trades Association, to raise awareness of peat-use replacement particularly among retailers and encouraged them to join and achieve the peat reduction targets of the scheme.

Participants in the scheme agree to set themselves targets to reduce peat year on year and to have policies that illustrate how they will do this. Companies' peat-use figures and policies are independently audited and those that meet certain targets, agreed by all members of the scheme, are then allowed to promote themselves as members of the GMI and display a logo on products that meet set criteria. As more manufacturers join the scheme, it is hoped to widen its membership to include growers and to begin promotion of the logo to help the public make a more informed choice.

Current Peat Use and Progress with Alternative Materials

Defra's 2008 research shows current total market use (growing media and soil conditioners) as 47% peat, with 99% of the peat being used in growing media. UK horticulture currently sources its peat from three areas, 38% from UK bogs, 60% from Ireland and 2% from Northern Europe.

Much of the UK's peat extraction was, until recently, on designated nature conservation sites. This has changed markedly over the last 10 years as the conservation value of the bogs has become more widely recognised. The government has spent several millions of pounds in compensating companies to end peat extraction and embark on the lengthy process of restoration.

The main peat-replacement products used are either bark, wood fibre, coir or specifically selected composted green wastes. There is also continued interest by some to use by-products or waste stream materials. The ultimate goal of peat-replacement is to use sustainable components, preferably sourced as close to market as possible, which actually add value to the final "compost" mix (including factors such as potential disease suppressive properties and enhanced shelf life both in terms of water holding and nutrient release). Although many by-products and waste stream materials carry greater environmental benefits, they often require greater effort (technically and logistically) and can therefore be more expensive.

Consumer Awareness

Despite public awareness campaigns by different organisations, the issue of peat and the destruction of peatlands has failed to capture the imagination of the general public in the same way as those on tropical hardwoods and deforestation.

Those who tried the early peat-free products often judged that they performed badly and reverted to peat-based products. Since then, formulations have been improved and customer confidence has increased.

The part played by major retailers in encouraging peat replacement in horticulture in the UK should not be underestimated. They were the first to encourage peat-reduced mixes, marking a significant step forward in reducing peat use since partial dilution is becoming the norm for products that were previously all-peat. Three major national gardening retail companies (B&Q, Homebase and Focus) have policies that are driving the replacement of peat in the direction of meeting government targets. B&Q believes there is a demand from their customers as just over 50% of its current growing media sales are peat-free.

Professional growers are also beginning to use peat-reduced and peat-free mixes as demand, and their confidence in using these media, increases. These growers have been prepared to take the risk and make the investment, familiarising themselves with new mixes and placing themselves at the forefront of the modern market. The reluctance of other professional growers stems from a variety of factors, probably associated with the financial implications of increased nursery costs and of familiarity with established practices.

The Carbon Economy

The importance of peat soils as a carbon store, and hence its role in both adapting to and mitigating climate change, is focusing more attention on conserving peatlands. Although the carbon dynamics of peatlands are complicated and often site-specific, the large quantity of carbon stored in peatlands is incontrovertible, as is the need to keep this carbon safely stored away and out of the active, greenhouse-impacting carbon pool. Peatlands in the UK are believed to store more carbon than the forests of the UK and France combined.

Conserving peatland carbon stores is increasingly recognised by the UK Government as a significant contribution towards climate change mitigation, analogous, in the post-Kyoto talks, to avoiding deforestation.

Peat formation takes carbon out of the active carbon cycle, whereas peat extraction brings this carbon, stored slowly at the rate of a metre depth per millennium, back into the cycle. Many peat alternatives also cause the release of carbon but this is much more recently sequestered and most materials are considered as being much more carbon-neutral.

Conclusion

The development and initiation of the GMI scheme has enabled environmental and business interests to share issues and concerns and build a common understanding to develop a practical way forward to achieve peat-replacement in the UK. The Government's peat replacement target for 2010 has been a key stimulus for encouraging the group to come together and find a common purpose.

The development of growing media based on non-peat materials will attract increasing attention as the need for a coherent EC policy on peat use becomes ever more relevant. With peat bogs and mires becoming increasingly recognised as important carbon stores, together with the wider benefits of having peatland habitats in good condition, the need to establish peat replacement will become more important in Europe, and Europe will need a more coordinated approach linking carbon management with habitat protection.

We hope that the UK experience of working towards peat replacement will help to develop sustainable growing media throughout Europe, as an important contribution by the horticulture industry to resolving some of today's key environmental issues.

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