

## **The Development of Responsibly Sourced Growing Media Components and Mixes<sup>©</sup>**

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The U.K. Government White Paper on the Natural Environment of June 2011 set quite specific targets for ending the use of peat in horticulture in England and Wales. The result of an initial consultation on these targets led to the formation of a task force with a remit covering a number of inter-related project areas. The task force responded to the White Paper in October 2012. In February 2013 Richard Benyon, minister at the Department for the Environment, Food and Rural Affairs, acknowledged the work of the task force and encouraged the industry to continue the work programmes it had set.

One of the main projects to emerge from the task force was a 5 year programme of R&D and knowledge transfer jointly funded by the government and the industry to advance the responsible use of all growing media materials so that the industry could either meet peat reduction targets or demonstrate the constraints imposed by the targets.

This paper reviews progress with the programme of development work and summarises the work that remains to be done.

### **INTRODUCTION**

The quest for consistent good quality substrates for the production of container-grown plants is not new. In the 1930s geneticists at the John Institute (then in Merton, south London) required a growing medium which would ensure all their seeds from breeding and genetics research programmes should germinate and all seedlings survive, otherwise the expected Mendelian ratios would be distorted and perhaps uninterpretable (Lawrence and Newell, 1939). The problem William Lawrence had as curator was that the “home-made” substrates then used were not of sufficient quality and seedlings often succumbed to disease — meaning that the true results of breeding and genetics research were confounded (Lawrence, 1980). Lawrence and Newall therefore developed what the industry has ever since recognised as the John Innes range of growing media recipes for container substrates. Their most important feature was that they were developed using a prescribed range of materials and could reasonably be produced at different locations to the same standard. Their major problem was, being loam-based, their fresh density which, while acceptable where plants did not have to be transported did not work well where commercial volumes of plants were to be shipped from nursery to nursery or between nurseries and retailers.

To meet the growing media needs of commercial growers, from the mid-1950s scientists at the Glasshouse Crops Research Institute at Littlehampton in West Sussex developed substrates based on sphagnum peat and peat plus “silver” sand for container-grown plants — primarily the result of their visits to the University of California, Davis, USA home of the U.C. system (Baker, 1957). The development of specific mixes for the UK was documented by Bunt (1976).

As peat-based mixes became widely adopted by commercial growers in the U.K. so the demand increased for consistency in mixes for specific uses. Unfortunately the grading of peats was not to a sufficiently high standard and work at various locations indicated the need to improve the physical properties of mixes. In the U.K., mixes for outdoor container-grown nursery stock demanded a stable, open structure to avoid overwintering losses caused by waterlogging and freezing of the root ball. Various researchers investigated the use of additives, notably the work at the Ministry of Agriculture’s Efford Experimental Horticulture Station (EHS) near Lymington, Hampshire (now closed) led by Margaret Scott on the use of bark products as physical amendments to peat/grit mixes. Her research showed that the use of screened and graded pine barks, matured but not composted, gave the most consistent results. The work at Efford EHS was also supported

by the development of the technique for measuring the air-filled porosity of mixes, undertaken by soil scientists at the Agricultural Development and Advisory Service (Bragg and Chambers, 1988). The technique was designed to be quick and easy to use both in the laboratory and on nurseries to allow alteration in mix proportions to be distinguished and related to specific crop production systems.

By the end of the 1980s there was mounting pressure on the U.K. horticulture industry to audit its use of peats and to look for alternative materials to either dilute or replace the peat. Many of the conservation and wildlife non-governmental organisations came together to campaign for the removal of peats from horticultural growing media, and various reports, such as, Peat and Its Alternatives (HDC, 1990) and The Peat Alternative Manual (Friends of the Earth, 1991) were published.

Considerable efforts both in the U.K. and in the rest of Europe were begun by commercial suppliers and growers to develop peat-reduced and peat-free mixes. The primary barriers to the adoption of new mixes usually lay with obtaining consistent quantities of the alternative materials at a commercially acceptable cost.

During the 1990s various materials were trialled and, where appropriate, developed. Bark-based products continued to be developed as did other timber and wood-based additives. The period also saw the importation from Sri Lanka and India of ever increasing amounts of coir (coconut husk waste) and its use both alone and in mixes. There was also government-backed development work on the potential use of composted green waste from domestic and industrially derived sources. The latter development was heavily sponsored by the U.K. Government's Waste and Resources Action Programme, the function of which is to encourage recycling and create demand for recycled products.

By the early 2000s specific peat reduction targets were being set for U.K. horticulture. Other European countries, particularly Germany and the Netherlands, felt they had already achieved a consensus position on the use of peat in growing media and were prepared to see some use of peats in mixes in order to ensure a sustainable future for their industry (Schmilewski, 2012).

## **THE U.K. POSITION**

In 2011 the U.K. Government laid before Parliament a paper on the future requirements for the protection of the natural environment in England and Wales (Anon, 2011). Adopted as policy, it was the first to set specific targets for the future use of peats in horticulture in England and Wales. There were three target dates:

- 2015: From this date no peat is to be used in any public service planting or contract growing works.
- 2020: By this date no peat is to be used in "retail" bags of growing media or soil improvers purchased by amateur gardeners.
- 2030: By this date no peat is to be used by professional commercial horticultural businesses.

Defra (Department for the Environment, Food and Rural Affairs) was tasked with the implementation of the peat reduction targets and setting of the review dates associated with them. Defra set up a Sustainable Growing Media Task Force led by sustainable development consultant Dr. Alan Knight. The task force included representatives from growing media suppliers, growers, retailers, and researchers. Their job was to establish if and how the targets could be achieved on a voluntary basis without the need for further legislation to impose them.

A methodology or "road map" of the route to reduce peat use was agreed and the task force was divided into a number of smaller groups, each tasked with investigating specific areas that the industry could move forwards on over a period of 12 months. The task force chairman reported to Defra in late September 2012 and the minister responsible (Richard Benyon) agreed the road map in February 2013. The main points to emerge from the road map were:

- All growing media should be fit for purpose.
- All growing media and soil improvers should be made from raw materials that are

environmentally and socially responsibly sourced and manufactured.

- Commercial horticulture should use only responsibly sourced and manufactured growing media.
- Retailers should only stock products which meet agreed performance standards.
- All public sector procurement should include a requirement to source plants and products that have been grown in responsibly sourced growing media.
- Consumers should be able to make informed choices in their purchase of growing media and soil improvers.
- An improvement is needed in the quality and consistency of green compost such that it is able to fulfil its potential.
- Waste legislation should be no longer a barrier to the sourcing of high quality waste derived materials.
- A voluntary approach should be adopted to achieve the transition to responsibly sourced growing media use.

### **The Challenges**

It was recognised that these aspirations could only be achieved if a number of actions were implemented:

- There would continue to be a need for a group from all industry sectors to meet and assess if the review dates and targets were being met. Dr. Knight would be asked to continue to chair it.
- There would be a need for a major knowledge transfer and development programme to be undertaken over at least a 5-year period to identify and develop good practice use of materials and mixes by growers over a range of production systems.
- There would be a continuation of the criteria for assessment of all materials so that judgements could be made on their long term suitability of use.
- There would be a move to define basic performance testing of substrate mixes, especially for the amateur market, to ensure that whatever the consumer bought would have a reasonable chance of producing acceptable plant growth, assuming reasonable quality of seed and cutting materials or mature plants placed into the mixes.
- There would be a full economic assessment of materials to ensure that all costs (including environmental costs such as embedded water) were accounted for.
- All sectors of the supply chain had to fully engage with the processes and actions.

### **CONCLUSIONS**

It is arguable that the quest for quality and consistency in growing media is not new but the increasing recognition of the importance of different habitats such as peat bogs and mires has heightened the need for horticulture globally to assess its specific use of “peats.” Specifically in the U.K. and particularly in England and Wales, the U.K. Government wishes to see a phase out of the use of “peats” in growing media mixes across landscaping, retail sales of multi-purpose growing media, and in professional horticulture for the production of container-grown plants.

The growing media supply industry has been working closely with professional growers for the last 20 years and has already achieved massive reductions in peat use. The development of alternative materials has significantly helped in poor peat harvest years to ensure growers can obtain substrates which allow them to continue their businesses (HDC, 2012).

The challenge for the industry as a whole is to secure reliable and consistent materials which will replace or substitute to a greater extent the current use of peats. However, the caution which is needed here is that the total volumes of materials used by the U.K. horticultural industry are very small compared to, for example, the big energy producers who are also looking to replace fossil fuels with renewable biological materials. Hence, while materials can be identified which can and are added to existing growing media, other users may be able to command the market for them.

So, very much in the vein of the original work of Lawrence and Newall in the 1930s,

the industry is again challenged with attaining consistent quality substrates for a wide variety of uses which will allow all plant subjects to thrive.

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