

Environmental and Quality Issues Affecting the Selection of Growing Media[®]

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INTRODUCTION

Growing media have always been subject to gradual evolution. There will be few growers who have not adjusted and tweaked their composts over the years. Physically the emphasis has been on getting the right compost structure — the correct balance of air and moisture availability. Chemically there have been tremendous improvements in the accuracy of nutrient delivery. Increasingly we will see the introduction of biological agents said to improve plant health and create stronger resistance to attack by pests and pathogens.

Until recently growers based their growing media decisions on which peat to use, a choice probably driven by the compromise between price and quality. The inclusion of a structural amendment such as bark or grit would largely depend on crop type and market price. Today, as with every other industry, growers need to consider the environmental impact of their methods, which in terms of growing media means peat and pesticides.

The aim of this paper is to help growers to assess what action they need to take, if any, on the question of peat and to look at progress with nonchemical means of pest control as they affect growing media.

THE USE OF PEAT

Having started in the late 1980s, the peat debate is still a current issue for growers, even though the latest official figures from the Department of Transport, Environment, and the Regions (DETR, 2000) suggest that the uptake of alternatives has been limited. As suppliers to the market place, growers are not really in a position to take a stand on the rights and wrongs of the argument. To succeed they must supply what the market wants. However, most anecdotal evidence suggests that amateur gardeners are not creating a huge demand and this is borne out by the DETR study. The DIY (do-it-yourself) multiple retailer, Sainsbury's Homebase, reports that despite offering both peat and peat-free products, the peat-free range accounts for only 15% of sales. But a market research exercise undertaken by Homebase's competitor, B&Q, revealed that 63% of its customers did not know that growing media are made from peat.

So if the end customer is not yet demanding change, should growers bother to look for alternatives? What is driving this issue?

Response to Market Influences. In the short term it will be the buyers and the market served that will influence this decision. For instance, local authority suppliers will increasingly find peat-free or peat-reduced stipulations in their specifications. After 2002 The National Trust will not accept plants grown in peat, if its 1999 AGM resolution is adhered to. Notcutts Nurseries recently announced development of a new 5 acre "minimum-waste" containerised tree unit supplying products in a peat-free medium.

B&Q is one retailer with a firm environmental policy. In its third environmental review the company states: "B&Q recognises that the use of peat in growing media does not have a long term future. Actions will be taken to reduce our dependency on peat but these actions will not compromise product performance or customer confidence" (B&Q, 1998). The company plans to move towards a phased reduction of peat in the container plants it sells.

Nevertheless there will be many growers who perceive no immediate need to move away from peat. They may be interested to know that whereas there are no indications that the Government will ban the use of peat, there are various initiatives that have a bearing on the situation:

- The DETR's "Monitoring and Assessment of Peat and Alternative Products for Growing Media and Soil Improvers in the UK" (DETR, 2000) — a report on a 3-year study into the trends in the use of peat and alternatives, designed to assist the Government in developing its planning policy for new peat workings.
- Two key recommendations of the DETR Peat Working Group report (1999) focus on peat reduction and development of alternatives.
- The Government-endorsed U.K. Biodiversity Action Plan (1994) aims for a minimum of 40% of the total market requirement to be peat-free by 2005.
- The Royal Commission on Environmental Pollution 19th Report (1996) recommends that the Government sets targets and agrees plans with the horticultural industry to progressively reduce the use of peat and to promote the use of alternatives.

A trend within these factors is for peat reduction rather than an immediate switch to peat-free production. The peat conservation lobby still has the long-term objective of zero peat, but while lobbyists have every intention of keeping the pressure on for this goal, they now largely accept that phased reduction is a more realistic way forward.

REDUCED PEAT PRODUCTION: REALISTIC ALTERNATIVES TO PEAT

For growers interested in reducing peat use there are many advantages to a phased reduction. Many of the materials discussed below can be slotted in to a peat-based mix without problems, allowing growers to gain experience of handling a new material without losing the comfort of working with a medium they know well. It can demonstrate commitment to the buyer and puts the grower in a good position to go completely peat free should the market demand it.

A grower contemplating peat reduction needs to be able to answer the following questions:

- Is the alternative as technically suitable as peat?
- Will there be enough if everyone wants to use it?
- Will it be priced competitively with peat?

Listed below are the materials most likely to supplement peat as major growing medium ingredients in the foreseeable future.

COIR

Is it as Technically Suitable as Peat? Under the right circumstances coir can be used as the basis of a good growing medium. Watering and nutrient management

are slightly different from peat and many of the most successful mixes are made up of blends with other materials, such as, bark or wood fibre. It is essential to buy from a known source where there is full control over quality.

Coir is moisture retentive and easily rewetted. These features make it useful in peat-free media where the other ingredients may be too freely drained. It has a higher pH than peat and its use in ericaceous media can therefore be restricted.

If Everyone Decided to Use it Would There Be Enough? It is highly unlikely that the entire industry would move to using coir, but if they did, demand would certainly outstrip supply of material of the quality required. In 1999 41,000 m³ were supplied to retail and commercial users in the U.K., 65% of which went to commercial growers (DETR, 2000). The U.S.A. is becoming a considerable user and draws on the same sources of supply as the U.K.

Is it More Expensive than Peat? Coir costs about the same as a good quality peat. As with peat, the effect of location will have a bearing on the final delivered cost.

Case History — Darby Nursery Stock. For its peat-free range Darby uses coir together with wood fibre and lignite. The nursery can truly claim its plants are a peat-free product as all propagation is now carried out in a coir, bark, and perlite mix.

COMPOSTED GREEN RESIDUES (WASTE FROM PARKS AND GARDENS)

Is it as Technically Suitable as Peat? Composted green residue will never be a single replacement but if carefully sourced from a reputable supplier it can be used with great success as a partial ingredient of a peat-free mix or as a peat diluent. Used at up to 30% it can provide a slow release of useful nutrients, is a good wetting agent, and can be graded finely enough to have a good moisture-holding capacity. The pH is high, typically around 7.5, which limits its use to nonericaceous stock. The nutrient content, whilst being a useful back up to any fertiliser regime, necessitates revision of the nutrients used in peat mixes.

Would There Be Enough of it If Everyone Decided to Use it? There is already more than 20X the amount needed if the entire industry turned to it tomorrow, and more and more composting operations are being installed as a matter of urgency to fulfil the requirements of the European Union Directive on the Landfill of Waste. Although currently most would not be of suitable quality, more and more waste handling operators are improving their quality in an attempt to access higher value markets.

Is it Likely to Be More Expensive than Peat? It is extremely likely to be much cheaper than peat. A typical cubic metre cost might be £6 or £7 for a screened fit-for-purpose product. Being dense it does not travel very efficiently, so being in close proximity to a producer is essential.

Composted green residues do, therefore, offer a realistic option for some reduction of peat. It is essential that the supplier understands growers' needs for a consistently graded, contaminants-free material, and this will usually restrict its use to those nurseries who mix their own compost or have a very good relationship with a local growing medium manufacturer.

Case History — Notcutts Nurseries. Notcutts recently announced its investment in a new 5-acre environmentally friendly containerised tree production site. The company is incorporating a percentage of green waste into the bark/wood fibre mix with great success — 5500 trees were already on display for potential purchasers last May and will be ready for despatch by the late summer of 2000.

Some of the larger nurseries have been looking at composting their own green waste and recycling it. While not strictly peat-free in most cases, it should certainly be considered as environmentally favourable if it diverts waste that would otherwise have gone to landfill.

Bark and Wood Fibre. Bark has been used as an additive to peat for about 20 years now in the U.K., predating the debate about peat and for purely technical reasons, those being to ameliorate the peat structure to give better quality growth. This is the hard, chippy product which in no way resembles peat. However, used at up to 35% of the medium, it can be seen in marketing terms as a useful reduction of peat.

Since the onset of the peat debate an increasing amount of bark and wood fibre has been sold in a finer form as a peat replacement into both the retail and the professional growing markets.

Is it as Technically Suitable as Peat? Many trials and commercial applications of bark/wood fibre substrates have shown that these mixes can be as good as peat. They handle similarly to peat and nutrient and pesticide applications can be almost identical to those for peat-based mixes. They are particularly useful as diluents of peat, allowing significant reductions in peat use, without noticeably changing the character of the mix. They are also useful diluents of other less appropriate peat alternatives.

The origins of bark and wood fibre are such that products of extremely uniform consistency can be made. Unlike peat, bark can be screened quite vigorously without harming its structure. Products of known, definable particle size and porosity can therefore be manufactured.

Would There Be Enough If Everyone Decided to Use It? The latest DETR figures suggest that 1.2 million m³ were sold into the entire horticultural industry in the U.K. last year, a figure which includes products sold as mulches and soil improvers. Obviously not all of that would be potentially of growing medium quality, but it gives an idea of the quantities already being handled by the industry. Forestry Commission projections for the quantities of bark which will become available over the next 10 years suggest that they will nearly double.

The quantity of wood fibre currently being handled is small by comparison to that of bark — only 3% of the total, but here there is great potential not only in terms of product quality, but also availability. There is also much potential offered by the residues of the furniture industry, which currently generates over 3 million tonnes of waste wood annually.

Is it More Expensive than Peat? Prices for barks and wood fibres sold as peat alternatives are usually around the same or slightly more than peat, depending on location. In the future the use of waste wood from the furniture industry should help to reduce production costs.

Bark sold as a peat ameliorant is usually more expensive per cubic metre than peat. To be efficient this type of bark needs to be chippy, preferably pine-based and

very different to the fine grades sold as peat alternatives. It is particularly useful for the longer-term, higher-value crops where the higher unit cost of the growing medium can be justified.

Case History — Close Nursery. This company sells a proportion of its stock to Prince Charles for open days at Highgrove, as well as being suppliers to the National Trust. This is a specialist retail nursery under moderate pressure to look at alternatives. They trialled peat-reduced and peat-free mixes using wood-fibre and/or fine composted bark with success and will probably move to a phased reduction of peat as a result of the trials.

The peat issue inevitably dominates any discussion on the state of growing media for nursery stock producers, but there are one or two other exciting prospects that should not be overlooked.

MYCORRHIZAE, BACTERIA, AND PATHOGEN SUPPRESSION

Most of us have a nodding acquaintance with the theory behind the use of mycorrhizae, that being to extend the effectiveness of the plant's own root hairs and give the plant greater resources to obtain water, nutrients, and to fend off disease. Beneficial bacteria can largely carry out the same functions but both are scarce in most loamless media. Until recently there were few effective "off the shelf" products, but now an increasing number of products is becoming available. In this country most growers are only trialling the products at this stage but there are some impressive results from The Netherlands.

A typical cost would currently be £6 m⁻³ and in the case of the bacteria, a follow on of further drenching would be required to maintain optimum activity.

It has long been recognised that under certain circumstances, the use of composted materials in a growing medium can give a measure of control against soil-borne pathogens. Although two Horticultural Development Council projects demonstrated the effect (HDC, 1994; 1995) there is not enough evidence using U.K. products to make fungicidal claims. However, recent laboratory studies at Nottingham Trent University have clearly illustrated an effect using leached columns of composted pine bark (Clews, 2000). In view of the ever-decreasing availability of pesticides it is highly desirable that funding for fundamental research into this phenomenon is found. A useful review of the current state of research in the U.S.A. can be found in Hoitink et al. (1998).

POT MULCHING

Herbicide use is also coming under environmental scrutiny and nonchemical control methods are being developed. Pot mulching can help under certain circumstances and a variety of materials is available for the purpose. An HDC study into pot mulching established that several different pot topping materials have the potential to achieve sustained levels of weed control at commercially acceptable levels and costs (HDC, 1996).

CONCLUSION

Although environmental concerns are adding to the managerial pressures on growers, there are significant developments in the field of peat alternatives and biological agents which will enable them to fulfil the demands of the market.

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