A Report

for

Horticulture and Potatoes Division

Department for Environment, Food and Rural Affairs

PEAT AND PEAT ALTERNATIVES: THEIR USE IN COMMERCIAL HORTICULTURE IN ENGLAND AND WALES IN 2003

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May 2004
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INTRODUCTION

This report examines the trends in the use of peat and alternative materials in the commercial horticultural sector in England and Wales. The last review of this nature was carried out in 2000 by ADAS on behalf of the then Ministry of Agriculture, Fisheries and Food (MAFF), since when there has been substantial additional interest in the use of alternative materials in growing media. Results are reported by sector: the categories of production used in the previous report i.e. Bedding Plants, Bulbs, Container Nursery Stock, Cut Flowers, Glasshouse Salads, Mushrooms, Pot Plants, Soft Fruit and Vegetable Transplants have been retained to facilitate comparison and identify trends. The volumes of peat used have been calculated from the most recent Defra Census or Survey data and are, therefore, based on numbers of plants, or the crop area grown, in England and Wales. ADAS specialists, using their knowledge of the industry, have estimated the average percentage of peat used in substrates for each sector. The policies of the major multiple retailers and the effects of these on substrate and peat use by commercial growers are also discussed.

1. SUMMARY

The overall volume of peat used by the professional horticulture industry in England and Wales, as calculated using Defra statistical data on plant numbers, has fallen by some 10% from that used in 2000, to around 756,000 cubic metres per year. This is about 22% of the total amount (3.4 million cu m) of peat used annually by the UK horticultural industry (the amateur gardening sector accounting for most of the rest) (ref: ODPM (2002), ‘Monitoring of peat and alternative products for growing media and soil improvers in the UK, 2001).

The reduction in peat use estimated has, however, been largely brought about by lower demand from those sectors that are contracting – pot plant, mushroom and salad plant production. There has been an increase in use by the bedding plant, soft fruit and bulb sectors, due to increases in production. The main uptake of peat alternatives has been in ornamental plant production, due to pressure from the multiple retailers imposing environmental policies on suppliers. The decision by The National Trust to ban peat use on its properties and in plants sold from its Plant Centres has had some influence and has increased interest in peat alternatives. The main multiple retailers in the UK all have policies on peat reduction over varying time-scales.

2. TRENDS IN PEAT USE BY PROFESSIONAL HORTICULTURE

The Defra Census and Survey figures have been used as a basis for calculating the volumes of peat used, as they were in previous exercises. These may give a slight underestimate of substrate (and hence peat) used, as growers often do not include
wastage in their returns (i.e. plants grown but not sold due to over-production or poor quality). This could increase production figures, and hence peat use, by 15-20% overall.

There are some problems also with definitions, for example plant species such as Primula may be classed as either bedding or pot plants and other species may be classified as either ‘patio plants’ (usually included under bedding plants) or nursery stock. In recent years attempts have been made to improve the Survey forms and, on balance, returns should be more accurate than they were in the past.

Professional growers still use a larger percentage of imported peat than the amateur gardening sector. The majority of imported peat is from Ireland, but imports of younger peats from Finland, the Baltic States and Russia have increased. These are most frequently used by nursery stock producers because of their suitability for long-term crops, particularly crops over-wintered outdoors, which need a growing medium with good drainage characteristics. Much of the imported peat is shipped in bulk or bales and manufactured into growing media in the UK. It is estimated that at least 60% of peat used in the nursery stock sector is non-UK peat and the percentage from countries other than Ireland is increasing. The peat used by the other major sectors, mushroom growers and bedding plant producers, is from a mixture of UK and imported sources.

3. CUSTOMER POLICIES

The major multiple retailers in the UK have corporate social responsibility policies, which include the use of natural resources such as peat. Many local authorities also have policies on peat and these extend to purchasing plants grown in alternative materials, where available. Most retailers and local authorities have had environmental guidelines for several years, which include not using peat that has been extracted from sites with SSSI (Sites of Special Scientific Interest) status. More recently, peat has been generally regarded by the environmental policy departments of such organisations as ‘unsustainable’ as a raw material and suppliers are being asked to reduce the volumes of peat used, whether the peat is of UK origin or imported. Suppliers to multiple retailers are typically being asked to substitute a percentage of the peat in their substrates with other materials (commonly a 20-25% inclusion rate at the moment). Growers supplying National Trust properties and plant centres have to supply all plants as ‘peat-free’, with the exception of ericaceous shrubs.

Summary of some of the major multiple retailer public policies on peat

- **Marks & Spencer** – Policy of peat reduction for all flowers and plants that are not soil-grown. All suppliers (UK and non-UK) are required to use a maximum of 75% peat in the growing medium where possible (i.e. without affecting plant quality) and this will be reduced to 50% in 2005. Independent trials on shelf-life of reduced peat plants have been carried out with promising results, the ‘reduced peat’ plants generally having superior shelf-life properties compared with plants grown in 100% peat.

- **B&Q** – Policy of peat reduction for the amateur growing media products they sell and a peat dilution policy for plant suppliers (25% of the final potting substrate used should be a peat alternative). Peat reduction is one element of the company’s ‘Quest’ initiative.
♦ **Homebase** - Company target of 50% of their growing media and soil conditioner products to be peat-free by 2005, reducing to 90% peat-free by 2010. Plant suppliers are being asked to use reduced peat media where possible.

♦ **Focus Wickes** - From 2003, suppliers of live plants to Focus Wickes have been required to review annually the media they use, with the aim of progressively reducing the peat content without loss of product quality. Plants sold by Focus Wickes are labelled to show the percentage of peat in the growing medium.

♦ **Safeway** – Suppliers of peat and plants are required to comply with the latest Peat Extraction Guidelines and Safeway is actively looking to reduce its reliance on peat through the use of alternatives. They have a target of reducing the amount of peat used to 50% of 2001 sales by 2005.

### 4. PEAT AND ALTERNATIVES USE IN OTHER EUROPEAN COUNTRIES

The high percentage of peat used in professional growing media in countries, such as the UK and Germany, reflects the occurrence of peat bogs with reserves of peat of a high standard. Other European countries without peat reserves, such as France and The Netherlands, have always used a wider range of raw materials to manufacture growing media. Peat only makes up about 40% of the total growing media produced in France and pine bark is widely used because of its availability. However, much of the growing media manufacturing in France is for the amateur market.

Peat is likely to become more expensive and this will make alternatives more competitive. At the moment peat is cheaper than most other substrates; this has hindered uptake of alternatives, as customers have not been willing to pay any extra for the plants grown. Germany and the UK have been substantial peat suppliers in the past; however, in both these countries peat extraction is declining, whereas production is increasing in the Baltic States (Estonia and Latvia currently supply about 20% of horticultural peat used in the UK). Following the accession to the EU of these countries, it is anticipated that the cost of their peat may well rise. Supply will also be restricted by environmental policies, for example Estonia has a policy that peat extraction may not use more than 1% of the country’s peatlands (ref: ‘Wise Use of Peatlands, Joosten and Clarke (Ed), 2002).

Within Europe, the countries in which suppliers are being asked to commit to reductions in peat use are the UK and Switzerland. Ikea in Sweden also has a policy on peat use by its suppliers. The Dutch horticultural industry relies on exports and is reacting to this change in some of their markets by investing in research into new growing media. A joint project, triggered by Dutch suppliers needing to meet the requirements of Marks & Spencer and valued at €280,000, is now in its second year. This involves Intergreen, the Dutch auction, the substrate manufacturers association, the Dutch accreditation organisation (RHP), the research institute at Wageningen and Dutch growers.

Dutch substrate manufacturers are less reliant on peat than the UK ones and have always used a wide variety of raw materials. With companies based in the Rotterdam area, they are well placed geographically to import by-products such as coir, bark and rice husks. They have responded to the demand for reduced peat media quickly and are gaining
market share in the UK, via companies like Tref Ego. UK manufacturers were traditionally located in the North and West of Great Britain, near the peat bogs, but further from sources of some alternative raw materials. However, there are examples of new manufacturing plants being developed in the South of England.
5. PEAT AND ACCREDITATION SCHEME REQUIREMENTS

♦ British Ornamental Plant Producers (BOPP)

BOPP is the most widely accepted accreditation scheme for ornamentals producers in the UK. Presently, the majority of members, of which there are now 29, grow pot or bedding plants for DIY Superstores. This arises from the history of the scheme, whereby this sector wanted to satisfy the growing demands of multiple retailers, principally B&Q and Homebase.

Newer members include growers of hardy nursery stock, flowers and bulbs. This means that BOPP now covers the whole ornamentals sector. Substantial expansion, to well over 100 members, with growth from the new sectors, is expected over the next couple of years. B&Q, Homebase and Focus have traditionally been strong supporters of the scheme. More recently, all the major supermarkets have supported the scheme, in some cases financially, and this has prompted increased membership from the flower and bulb sector.

BOPP is in the process of becoming both UKAS accredited and benchmarked to the globally recognised EurepGap Standard for Flowers and Ornamentals, enabling BOPP members to claim EurepGap certification automatically.

Concerning the use of peat, the BOPP requirements are summarised in a simple paragraph as follows:

Peat should be sourced from non-SSSI sites. Written evidence of this will be required. A commitment to assessing potential alternative substrates for use in peat-free or reduced-peat mixes should be made and actions recorded. Where appropriate, customers should be informed of cultural, environmental and financial implications of its use.

In auditing the scheme, the following ‘evidence of compliance’ is requested from members, in order to achieve accreditation:

- Letters or certificates from all their growing media suppliers to declare that peat used has not been sourced from SSSI sites.
- Statement to say how the business is approaching the issues of peat reduction.
- Evidence of trials conducted, or monitored, on alternative growing media.

These requirements are inspected even more rigorously when a BOPP member is supplying a major multiple that has a stated peat-reduction policy.

In summary, there is no current requirement within BOPP protocols, to reduce the volume/percentage of peat used in mixes, but there is this requirement to assess alternatives and record the results and conclusions of the assessment.
♦ EurepGap

EurepGap is an organisation that was originally set up to develop an international standard for ‘Good Agricultural Practice’, focused initially on maintaining food safety. A new standard was prepared, by representatives, principally from UK supermarkets, who are members of the EurepGap Technical Standards Committee for Flowers and Ornamentals. The objective of this organisation is that this standard is applied across the whole supply base that feeds into the supermarket members. An internationally agreed standard will ensure that excessive auditing is avoided and growers/farmers can focus on the objectives of a single agreed code.

As the Standard is internationally agreed, there is little emphasis on peat. Members from outside the UK do not see peat reduction as a priority and therefore it has not been included within the standard to any great extent. The only condition applied is Control Point 5.5.9, which states:

“Are substrates traceable to the source and do they not come from designated conservation areas?”

For this, growers would need to demonstrate that any peat used had not come from a conservation area. This would normally be done via a letter from the peat supplier. EurepGap does not contain any commitment to peat reduction.

♦ MPS

MPS (Milieu Project Sierteelt) is a Dutch-based environmental qualification system based on records kept by its grower members. Grower members submit monthly data to MPS showing their use of:

- Crop protection agents (pesticides)
- Energy
- Fertiliser
- Waste
- Water

Points are attributed to the different sections and growers are awarded an A, B or C classification depending on how well they compare to the ‘average’ grower and how well they have reduced these inputs per square metre.

Although developed in The Netherlands, the scheme has been widely taken up around the world as a way for growers to demonstrate environmental responsibility. As the UK was not involved in the development of MPS there are no requirements, within the scheme, that relate to peat use. However, through the encouragement of Marks & Spencer, in the UK, MPS has been in discussion with BOPP about setting up a UK version of the scheme and it is likely that peat reduction would be included as one of the criteria to be monitored.
Other Schemes

The above mentioned schemes represent the only accreditation schemes widely accepted in the UK ornamentals industry and these schemes only include peat reduction as required by multiple retailers.

The only other schemes, to which growers need to comply, are specific customer schemes such as B&Q’s ‘Quest’ that sets strict peat-reduction targets for suppliers.

For edible crops, the Assured Produce generic protocol (2003) requires the re-use and/or sterilisation of substrates, where this is appropriate, but does not lay down any prescriptive measures as to choice of ingredient.
### TABLE 1 - PEAT USE BY SECTOR, 2003

<table>
<thead>
<tr>
<th>SECTOR</th>
<th>Cubic metres</th>
<th>%</th>
<th>Change from 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Container Nursery Stock</td>
<td>306,000</td>
<td>41</td>
<td>-3%</td>
</tr>
<tr>
<td>Bedding Plants</td>
<td>167,000</td>
<td>22</td>
<td>+15%</td>
</tr>
<tr>
<td>Mushrooms</td>
<td>90,000</td>
<td>12</td>
<td>-39%</td>
</tr>
<tr>
<td>Vegetable Transplants</td>
<td>59,000</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Bulbs</td>
<td>48,000</td>
<td>6</td>
<td>+9%</td>
</tr>
<tr>
<td>Pot Plants</td>
<td>47,000</td>
<td>6</td>
<td>-38%</td>
</tr>
<tr>
<td>Soft Fruit</td>
<td>21,000</td>
<td>3</td>
<td>+24%</td>
</tr>
<tr>
<td>Glasshouse Salads</td>
<td>10,000</td>
<td>1</td>
<td>-44%</td>
</tr>
<tr>
<td>Cut Flowers</td>
<td>8,000</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>756,000</strong></td>
<td></td>
<td><strong>-10%</strong></td>
</tr>
</tbody>
</table>
6. PEAT USE BY SECTOR

♦ Container Nursery Stock

Nursery stock (hardy plant) production increased from 163 million container plants in 1992 to around 230 million in 1997/8 and has since levelled off. The use of alternatives to peat is well established in this sector, with significant amounts of bark used (usually at 15-25% of the mix) and also some use of green compost and loam (usually at 5-20% of the mix, where used). Many alternatives to peat such as coir, perlite, fine bark and woodfibre are now used in the propagation of cuttings. A small percentage of container nursery stock is now being grown in peat-free media, mainly for local authorities and National Trust outlets.

Timber industry by-products can successfully be used as a supplement to peat in growing media for both nursery stock and herbaceous plants, to produce ‘reduced peat’ plants, if required by multiple retailers. Ericaceous plants, such as *Rhododendron* and *Azalea* are more difficult subjects in which to use totally peat-free substrates, due to their long-term nature and sensitivity to high salt levels and/or high pH.

♦ Bedding Plants

Peat consumption has increased since 2000, due to increased production. However, peat substitution within the bedding plant industry is becoming common practice, principally driven by the major retailers and to a lesser extent by accreditation schemes. Substitution levels vary from 5% up to 25% or more. A very small number of growers are using peat-free growing media to meet the demands of customers, such as local authorities. Composted bark is probably the most frequently used additive; coir is used to a lesser extent, whilst there is increasing interest in wood fibre (from Germany). There is limited uptake of green compost, as the industry still needs reassurance about its quality.

This sector is very production cost conscious, and it is often economic factors that have hindered uptake of alternatives, rather than concerns over performance. Trials, including those funded by the Waste & Resources Action Programme, have shown that several of the peat alternative blends available perform perfectly satisfactorily for short-term, less demanding, crops such as bedding plants. The bulk density of the substrate is also very important to bedding plant producers who supply national chains, as it influences transport costs. Materials that are significantly heavier than peat therefore pose problems. Woodfibre has a low bulk density and this is a major reason for its uptake in the last year by several large bedding plant producers, who are required to use a reduced-peat medium by their multiple retailer customers. The bedding plant sector also uses mechanised systems; hence new substrates have to flow well to be compatible with pot-filling and potting equipment.

♦ Mushrooms

Peat is the ideal material for mushroom casing and is also used as part of the mushroom growing compost. Production of mushrooms in England and Wales has continued to
decline, due to relocation of production to areas with cheap labour, such as Poland, and it is this factor that has led to the decline in the volume of peat used. Alternatives to peat that some home mushroom producers are now using include coir and coal tailings. Composted wood fibre has also been shown to have potential as a partial peat replacement. The estimated level of peat substitution is 10%, hence this amount plus 10% sugar beet lime that is added, gives 110,000 cu m of casing used, equating to approximately 90,000 cu m of peat. A major barrier to the uptake of other materials is their higher cost compared with that of peat.

♦ Vegetable Transplants

Peat is used for raising vegetable plants in blocks (salad crops) or plugs/modules (brassica crops and onions). The area of outdoor vegetables, particularly brassicas, has decreased in recent years due to competitive market conditions, hence the use of peat by this sector has decreased since the early 1990s.

There are technical difficulties with getting non-peat substrates to bind together satisfactorily into the blocks used; these blocks must be robust enough to withstand use in automatic planting machines. The only current use of non-peat media is for the raising of organic transplants. Results have been good, but cost is limiting the uptake (plants are 50% more expensive to produce, although this premium would decrease if the volume increased).

♦ Bulbs

The Horticultural Development Council has funded work on peat substitution for lily bulb forcing in 2000/1 (BOF/PC 140), showing that alternatives such as woodfibre/bark blends can perform as well as peat. However, these have not yet been widely taken up by the industry due to the higher prices of the peat-free substrates. The use of peat alternatives will increase in this sector due to pressure from the multiple retailers through whom a large percentage of the end product is sold. Substitution for peat by other materials is technically easy to achieve for crops, such as pot bulbs; it is mainly economics that have favoured continued use of peat. Some peat is re-used for narcissus forcing and peat from tulip forcing is also re-used for lily forcing by some producers. Tulip growers are showing more interest in hydroculture systems, as used widely in The Netherlands, but the capital investment cost for this is high.

♦ Pot Plants

It is difficult to obtain accurate figures for pot plants grown in this country because of the large numbers imported and sold without being re-potted. The main lines grown in England and Wales are the winter flowering pot plants (Poinsettia and Cyclamen), pot Chrysanthemum and Primroses. Virtually 100% of the pot plants grown in this country are in peat-based mixes, with very occasional use of up to 25% of other materials, such as perlite or bark to improve the growing media structure. Many pot plants are grown in highly sophisticated glasshouses in which the substrate must be of very uniform high quality to allow accurate plant scheduling. There is still a lack of confidence that non-peat substrates can perform as well as peat and concern over their higher cost. This is despite
many pot plant growers in Holland and Belgium using high percentages of coir in their substrates with excellent results.

With the exception of cyclamen production, there is very little peat substitution within the pot plant industry. A number of growers have experimented with bark, wood fibre, coir and green compost but generally there is estimated to be less than 5% peat substituted in commercial crops (and this is often with clay granules, perlite etc). In the case of cyclamen production, the addition of bark to the growing media suppresses the incidence of certain root diseases and a peat mix with 20-25% bark is commonly used. Suppliers to the multiple retailers are trialling reduced peat media with up to 50% peat substitution and some are likely to move to such media on a larger scale during the next year or so.

♦ **Soft Fruit**

Peat is used in the propagation of strawberries and also increasingly in grow-bags for extended season protected production and for ‘table top’ systems where strawberries are grown in bags to avoid the risk of soil-borne disease and ease harvesting. The total volume of peat used is relatively low, but has increased by about 85% since 1995/6 due to an increase in the use of these systems. There is also a small area of protected raspberries grown in non-soil systems. There is some pressure on growers to adopt peat-free substrates from the multiple retailers and about 12% of production is now estimated to be in coir fibre. Coir is widely used by strawberry growers in The Netherlands.

♦ **Glasshouse Salads**

The majority of glasshouse salad production is in rockwool. The main use of peat is in the blocks for propagation of lettuce and tomato plants, but there has been competition from imported young plants in recent years and the volume of peat used by this sector has continued to decline.

One of the expanding areas within the salad sector is pot herb production for supermarket sales. The substrate used for these is mostly peat although some producers have been trialling reduced peat/peat-free media.

♦ **Cut Flowers**

Most cut flower plants are only propagated in peat blocks and then grown on in the soil, hence the volumes of peat used are relatively small. The blocks are then cultivated into the soil after the flowers have been cut. The volume of peat used by this sector is small and similar to that estimated in 2000.
7. CONCLUSIONS - THE CURRENT USE OF PEAT ALTERNATIVES

The overall volume of peat used by the commercial horticultural industry in England and Wales has reduced by approximately 10% since this exercise was carried out for the 2000 production year. Part of this reduction is due to increased use of reduced peat media, but falls in the level of production in several sectors have also had a significant impact.

There are a number of factors that have contributed to the low uptake of peat alternatives by professional growers over the last 10-15 years. The most important factor has been lack of customer demand for peat-free plants, despite campaigns by environmental groups. There has also been a lack of confidence in alternative products among growers. There has been a significant change in attitudes, however, since the last report and demand for reduced peat and peat-free plants has increased. Awareness of the issue is also increasing among the public.

There has been an improvement in the quality of alternative blends, although often at slightly higher prices than the established peat-based products. There is concern among growers that the use of alternatives to peat can increase the cost of production and this increase cannot usually be passed on to the purchaser. They are also concerned about the risk of lower plant quality, even if only from lack of experience of handling a different growing medium.

It is difficult, however, to cost accurately the effect of a change in substrate use, as the cost of the substrate itself is only one factor. Impacts on final grade-out and use of labour and other inputs will have far more influence, e.g. reduced peat media may require more management initially but a reduced need for pesticides and/or cleaning of pots at dispatch or reduced over-wintering losses could represent a significant cost saving. The sectors which are trialling peat alternatives and reduced peat media most widely are those that supply the multiple retailers and certain local authorities.

Research to date has suggested that there is no one material likely to replace peat in all its varied uses. However, there are now specific materials that perform satisfactorily for certain crops and purposes. The most promising materials are various timber industry by-products, including bark and wood fibre for outdoor crops and these as well as coir for protected crops. High quality green compost will also be a useful component of some mixes, particularly for less demanding crops.

There has been more interest from the multiple retailers in recent years in ‘reduced peat’ growing media. This has been perceived as an alternative to a straight switch to ‘peat-free’, as a way of reducing peat use gradually without such a dramatic effect on management requirements and production costs.