



## The selection and management of peat resources and peat alternatives for the production of quality growing media

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### Summary

Substrates used in modern commercial Horticulture are becoming increasingly specialised and more demanding of the raw materials used in their manufacture. Features such as : Granulation, Pore space, Water Capacity, Weed Risk etc are critical to the success of high performance growing media. Many alternatives to peat have been evaluated and incorporated into growing media in recent years, but for many commercial growers, peat remains the raw material of choice. However, in the hobby gardening sector, the increased use of peat substitutes is being driven by market forces, and producers have to balance the commercial and performance benefits of the alternatives available.

The characteristics of these alternatives have an impact on the types of peat which can be economically used in the manufacture of hobby growing media, and this now has to be taken into account during peatland surveys. Practical methodologies have been developed to derive maximum commercial and technical benefits from the diverse and extensive Peatland resource available to Bord na Mona.

**Key index words:** peat, green compost, survey, quality

### Introduction

Peat is an essential raw material in modern Horticulture. In most European countries raised bog peat continues to be a fundamental constituent of high quality growing media.

The favourable factors which ensure that peat continues to be the material of choice in both professional and hobby horticulture can be summarised as:

- A thoroughly researched stable cellular structure.
- Low bulk density ensuring ease of handling and transportation.
- Low pH, permitting appropriate pH adjustment for all crop types.
- Low nutrient content, allowing accurate fertilisation management.
- Freedom from pathogens, pests, seeds and plant propagules.
- Ready availability, consistency of quality and competitive pricing.

The most recent trials of hobby market growing media available in the UK, have again confirmed these benefits and reported the excellent performance of peat based products when compared with “low peat” or peat free materials. (Independent test programme by “Gardening Which”, January 2008)

### Materials and Methods

#### *Peatland Management*

Bord na Móna is one of the major European producers of peat, and its harvesting operations are conducted on a

substantial and varied Peatland resource. This peat is used in a number of diverse industrial applications, and it is essential that the maximum technical and commercial benefits are obtained from this valuable raw material.

- Each year, from a total Peatland area of 88,000 hectares the approximate amounts of material harvested are :
- 4 million tonnes of Energy Peat for power generation. (High density peat blended to meet strict calorific, moisture, and environmental criteria).
- 1 million tonnes of Energy Peat for the manufacture of briquettes. (High density, high calorific peat blended to meet low ash criteria).
- 2 million cubic metres of Horticulture Peat for Professional and Hobby Products. (> 90% export). (Selected for low degree of decomposition; low bulk density; zero, or very low, weed risk).

Almost all production is by the PECO system, which facilitates the exact matching of survey results with a specific section of stockpile on the bog. Some areas of HAKU harvested peat are now being assessed for Horticulture and a different procedure of sampling and classification is being developed for these sites.

#### *Horticultural Peatland*

The annual requirement of horticultural peat is produced on designated Horticulture Peatlands. The quality of peat being produced in each area is continually monitored and, if necessary, the area is reclassified accordingly. Additional



areas in “Energy” bogs are also highlighted as potential sources of Horticulture peat and are surveyed to determine if future development and reclassification is possible. The highest-grade horticulture peat is identified in each production area and is selected for the Professional Grower market.

Production procedures in Horticulture areas are designed to:

- a) Eliminate or minimise the contamination of the production fields by debris such as subsoil, drainage pipes, polythene waste etc.
- b) Maximise the production of coarse grade peat which can be profitably fractioned for the professional market.
- c) Ensure the continuous implementation of weed control activities.

On all Horticulture production areas, weed control is effected by mechanical methods only (ditching, offset milling, flail cutting etc) and no herbicides are used on any production fields.

## Survey Methods

### General

Approximately 180 kilometres of PECO stockpiles are surveyed during harvesting each Summer to obtain a “snapshot” of the quality of peat being produced at that time. The objective is to collect samples from each stockpile after the 4th/5th harvest has been lifted (This is approximately half way through the normal 10/11 harvest cycle used in Ireland).

Samples are taken at 100 metre intervals along the length of the stockpiles, and this is equivalent to one sample point for every 1000/1200 m<sup>3</sup> of peat produced.

### Details

At each sampling point, the surface peat is cleared away to a depth of approx 300mm to eliminate recent weathering effects, and two representative five litre samples are collected from the side faces of the stockpile. Each sample bag is clearly labelled with its identifying co-ordinates, and transported to the laboratory for evaluation.

### Testing

#### (a) Weed Germination

sample point, peat from one of the five litre samples is mixed with standard amounts of fertiliser and lime, moistened to approx 70% mc and placed into a seed tray (350mm x 210mm x 50mm).

All the trays are placed into a glasshouse and covered with fleece to retain humidity and to exclude airborne seeds.

The germination rate of any bog weeds in these samples is used to classify the peat stocks as suitable for either professional horticulture or hobby market products. (Keijzer, 2002)

#### (b) Particle Size (optional)

This test is used as an assessment of the performance of different production methods and to determine the suitability of the particular material for sieving into saleable fractions.

The sample is poured onto the test bench and a representative 500-gram sub-sample is selected. This is hand sieved through a sieve set (40mm, 20mm, 10mm, 5mm) and the percentage passing each mesh size is recorded.

#### (c) “Field” Loose Bulk Density

The actual “field” bulk density of the sample is measured by loose filling the sample through a 20mm sieve into a 1 litre cylinder and determining its loose bulk density (gram per litre).

#### (d) Moisture Content

The moisture content of the second sample is determined by drying a 10-gram sample in an oven overnight at 105°C

#### (e) Normalised Bulk Density

As samples are collected at a range of moisture contents, it is useful to “Normalise” the bulk density figures so that a valid comparison of data on an equal basis may be made.

Loose Bulk Density figure is normalised to 50% moisture content by mathematical adjustment.

$$\text{Normalised Density} = \frac{\text{Field Bulk Density at } y\% \text{ mc} \times (100 - y)}{50}$$

## Results

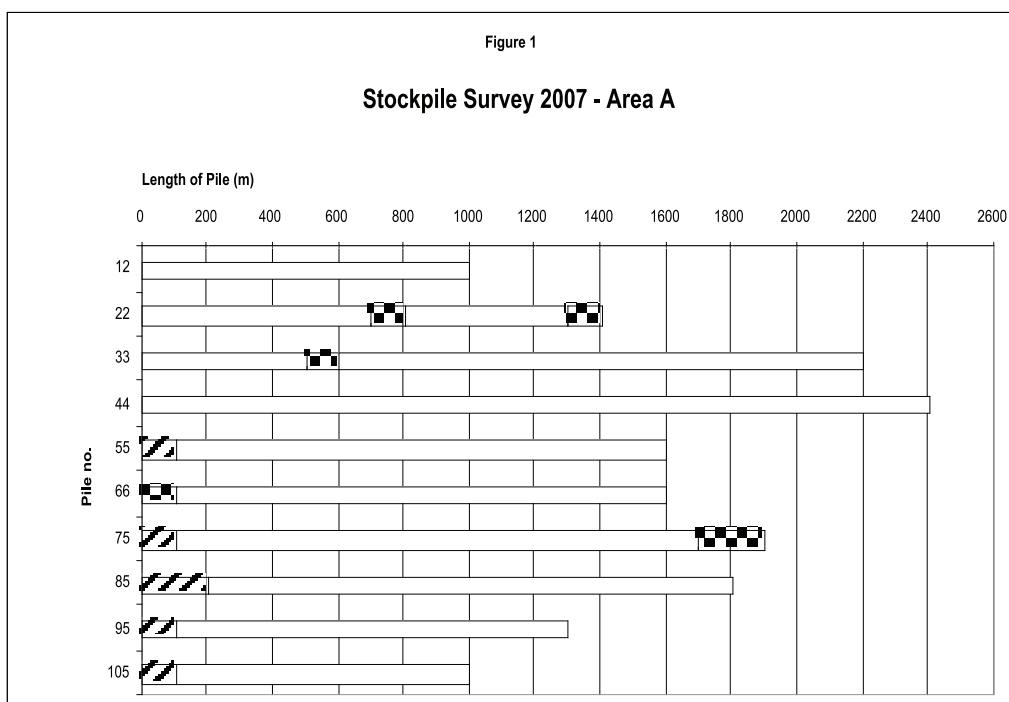
The results for Weed Germination (bog weeds per square metre) and Normalised Bulk Density (at 50% moisture) are collated for each stockpile. From this data, colour coded stockpile maps are produced for each production area. The colour system allows for the rapid identification of stockpile sections of high / low density, and sections of high / low weed-risk. These charts are circulated to Operations staff and are used for the planning and scheduling of stockpile loading during the year.

A black/white version of this chart is shown as **Figure 1**. The stockpiles shown in this figure range from 1000m to 2400m in length. The majority of the peat is Professional grade, but the chequered sections indicate weed risk and the crosshatched areas indicate high density.

Since its introduction, this survey has been used to identify moss peat resources appropriate for professional horticulture. Material with an unacceptable weed risk or unacceptable density has been categorised generally as “hobby market peat”.

In recent years, the development of large scale windrowing and composting facilities, has made available a consistent source of green compost. This has proven to be a suitable and acceptable peat alternative in hobby market products and provides positive water holding and nutritional benefits. (Prasad & Carlile, 2008)

However, this green compost is of consistently high density (> 400g/litre), and the increasing level of peat al-



**Figure 1.** stockpile chart

ternatives demanded by the market is increasing the weights of final products to a level that is having a negative commercial impact. In order to maintain logistics capabilities and maximise transport loadability, it is now becoming necessary to source hobby market peat of a lower density to offset the effects of the peat alternatives.

This year a further classification of hobby market peat is being introduced, based on its field density – low density hobby peat is identified for use in mixes where peat alternatives are being incorporated, and higher density hobby peat is being utilised in mixes where no green compost is required. This changing dynamic may force the earlier reclassification of some horticulture areas away from horticulture and into the energy peat category if final product densities become unacceptable due to the increasing percentage of green compost.

## Conclusion

This survey system has been in use for more than ten years and is being constantly reviewed in the light of

changing market demands. It has proven an invaluable tool in ensuring confidence in the quality of peat being drawn from different peatland production areas. The survey has also been used to drive and direct weed control programmes, and this continuous monitoring has provided verification of the effectiveness of the non-herbicide weed control programmes on an ongoing basis.

This strict evaluation and classification of a diverse peat resource will ensure that peat of the appropriate quality continues to be selected and delivered to meet the expectations of Professional and Hobby market customers throughout the world.

## References

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