

Green Issues and Growing Media—Progression or Digression?

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INTRODUCTION

Since environmental lobbyists began their scrutiny of growing media, enormous sums of money have been spent on research projects, conferences, insurance claims, and even failed companies. This paper aims, from a manufacturer's viewpoint, to consider whether progress has been achieved as a result or whether it has all amounted to a time-wasting digression.

Progress can be monitored in terms of increased profitability, but increasingly the effects of our activities on the environment must come into the equation. Although there can be sound marketing reasons for considering growing media from an environmental standpoint, it is extremely important that the considerable advances that have recently been made in compost quality, with their consequent benefits for profitability, are not compromised in any way.

USE OF WASTE PRODUCTS IN GROWING MEDIA

Few growers will be unaware of changes in waste legislation in both the United Kingdom and at European level. Waste is not an issue which can be dodged anymore. It has to be managed, controlled, and usually licensed. Most significantly, there are costs involved which were not there before. One result has been that those organizations, which generate waste products, have looked to markets, such as agriculture and horticulture, to find cheaper outlets than the increasingly restrictive and costly option of landfill.

There are those who believe that waste is a resource in the wrong place. However, it is estimated that the U.K. generates about 200 million tonnes of organic waste per annum, which is a large resource. Given that the entire horticultural industry uses less than 0.5% of this amount (Bragg, 1990), it would be easy to ignore the issue on the grounds of the negligible impact horticulture could have by using it. Indeed, there could be strong arguments for not allowing horticulture to be perceived as the dumping ground for other peoples waste.

However, there are other reasons why the issue of waste should not be overlooked. Firstly, there are marketing advantages to be gained from promoting methods of production which are environmentally favourable. There are many examples of large multi-nationals who consider it worthwhile promoting products from the environmental standpoint. Most major do-it-yourself (DIY) outlets in the U.K. have a policy on the use of peat, and one of the largest has started to exclude suppliers who do not have an acceptable environmental policy.

Secondly, governments in other countries are beginning to exert considerable power either legislatively or by awarding contracts preferentially to companies with proven environmental credentials. The U.K. government is currently engaged in an extensive study of the requirements of the horticultural and landscape

industries for peat and alternative products, as a prelude to formulating their future policy on peat.

Thirdly, there is evidence that some materials in the waste stream can be as effective or exceed the performance of peat, as discussed later, and finally, considerable cost savings are possible.

ASSESSMENT OF INGREDIENTS

Proper assessment of wastes as potential growing medium ingredients is essential if long-term success is to be achieved. Before any practical work begins it is possible to assess the suitability of materials in terms of their availability, consistency, geographical accessibility, cost, and ease of handling. Those which look suitable must then be tested in trials. Some which appear good on paper, will prove to have hidden problems when used in practice. One example is spent coffee grounds; the waste from the instant coffee industry is currently being landfilled at a cost of £18 per tonne. It is very similar to coir in appearance, has a low pH, low soluble salt content, and is available in suitable quantities at geographically favourable sites in the U.K. Unfortunately, in trials to date it has performed extremely badly, and so work on its use as a potential growing medium ingredient is unlikely to continue.

A composted blend of straw and sewage sludge performed very well in trials, but faecal aversion amongst the general public, and high production costs have prevented further development. Composted bracken has also performed extremely well in trials but until it is available in larger quantities, it remains unviable for large scale commercial exploitation.

Composted waste generated by parks, gardens, and vegetable food processing, collectively known as composted green waste, is rapidly becoming available at sites throughout the country, due to the changes in waste legislation already mentioned. Quality varies enormously, but there are indications that well-produced green waste can be effective when used at proportions of up to 30% in the mixes for easy-to-grow plants.

Local initiatives will be a key feature of the use of such products, as variability from one source to another and transport costs are likely to prevent the large-scale uptake by compost manufacturers. Nurseries growing large quantities of nonsensitive stock who are local to a composting plant could lower their production costs significantly given that current prices for green waste vary from nil to £3.50 per m³. However, success will only be achieved if the green waste is well-produced and consistent. The Composting Association is currently drawing up standards so that potential users may purchase with confidence from approved producers, but extensive trialling will always be necessary before uptake on a commercial scale is feasible.

Some growers, such as Wyevale Nurseries at Hereford, successfully produce and use their own composted green waste, and in the United States of America (U.S.A.) the practice is well-established.

TIMBER RESIDUES AS WASTE INGREDIENTS OF GROWING MEDIA

A by-product with potential for development on a far wider scale is derived from residues generated in British forests. Fulfilling all the above paper criteria and giving excellent performance in trials to date is Melcourt Sylva fibre. This is the matured natural pine fibre resulting from chipping the residue left on the forest

floor after the removal of the logs. Sylva fibre is consistent and sustainable, and has been extensively trialled in both glasshouse and outdoor situations. It is currently included in several nursery stock trials in the U.K. and, being very competitive with peat, it looks likely to play a major part in growing media of the future.

Bark is another forest product, considered a waste twenty years ago, which now provides sawmillers with a significant income and could certainly not be classed as a waste nowadays. Although its use in growing media can reduce the quantity of peat needed, its purpose in the mix is different and complementary to that of peat. As an environmentally acceptable and extremely effective product, bark is set to remain an important ingredient of both propagation and container media, while helping growers achieve environmental credibility.

CHOICE OF GROWING MEDIUM TO REDUCE PESTICIDE USE

Pesticides have been a green issue for many years and the trend is undoubtedly away from their use. There have been considerable advances in the field of biological control, but the armoury is still far from complete, particularly for outdoor crops. However, research both in the U.S.A. and the U.K. has demonstrated that growing media can be used as suppressors of root pathogens such as *Pythium*, *Phytophthora*, and *Rhizoctonia*.

It is believed that the mechanism of control varies with different organisms, but that the main effect is suppression due to competition created by microbial diversity. Hence the much greater effect seen in composted materials, which characteristically host a large and diverse microbial population, compared to peat, which holds only very low levels (Hoitink et al, 1993).

In the U.K., HDC-funded ADAS research has demonstrated significant control of both fusarium wilt in cyclamen and *Phoma* root rot in gentian using bark in the growing medium. In each case the best results have been achieved with a combination of fungicide and bark (HDC, 1993).

Field grown crops can also benefit from the same mechanisms. Many examples of significant control of soil-borne pathogens on soils dressed with composted materials have been noted by U.S.A. researchers (Logsdon, 1993).

Approved herbicides for nursery stock production are also becoming fewer, and increasingly the grower is being left to bear the risks of phytotoxicity himself. Pot mulching as a method of reducing weed, moss, and liverwort incidence is a useful alternative in some situations. Potting-grade bark is an effective material when applied to a 2 cm depth, giving excellent control of moss and liverwort, and reasonable suppression of weeds. Wool pellets also show potential. A disadvantage of any loose fill mulch is that they cannot survive the effects of the pot tipping over.

Woven mulches such as coir and wool mats also show great potential, although unlike loose mulches their use is generally restricted to single-stemmed subjects.

Cost comparisons depend very much on the scale of operation. The use of bark is currently extremely competitive with herbicides, whereas the coir and wool "pot toppers" are more expensive. However, it is likely that the costs of wool and coir will fall as volume sales increase.

CONCLUSIONS

Green issues have caused some digressions, but these are an inevitable consequence of progress. Consideration of the effects of nursery stock production on the

environment has presented us with new marketing opportunities; opened our eyes to the existence of materials other than peat; forced us into positive steps to protect the environment; and caused us to fundamentally and beneficially re-evaluate the way we operate.

LITERATURE CITED

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