Creating markets for recycled resources

R&D Report: Organics

UK Market Assessment for Composted Materials in Organic Farming

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Executive Summary

The Waste and Resources Action Programme (WRAP) commissioned the Organic Resource Agency Ltd, the Soil Association's Producer Services, Elm Farm Research Centre and the Henry Doubleday Research Association to undertake an assessment of the needs, scale and value of the markets for composted materials and competing products in the UK Organic Farming and Horticulture sector.

The underlying aim was to obtain current, accurate and robust information to provide WRAP with better knowledge of market demand so that it can work to actively develop markets for high quality, high value waste derived products and to stimulate growth in the composting industry.

The work was carried out between October 2003 and February 2004 and focused primarily on a comprehensive postal survey sent to licensed organic farmers and growers in the UK. The key objectives of the survey were as follows:

- Ascertain quantities of different types of organic matter, including green waste composts, used in the organic sector
- Ascertain an approximate market value for green waste compost within the organic farming and growing community
- Identify seasonal fluctuations in the application of organic matter
- Determine the geographic distribution of those organic holdings that are using green waste compost
- Identify the actual and perceived drawbacks to green waste compost usage
- Investigate the differences in usage of green waste compost between different organic enterprises
- Make projections on the future volume and value of the market for green waste compost in the organic sector.

Key Findings

The size of the market for green waste composted products used by the organic sector in 2003 was £239,383. The total tonnage of brought-in, ready-made green waste compost used on grass, field and protected crop production was 29,378 tonnes. A further 55,212 litres of green waste compost or green waste containing products was brought in for use in pot plant production and plant propagation.

Current end-users of green waste compost products were asked how they perceived their use of these products might increase by 2007 if a) quality remained the same and b) if their key quality issues were addressed.

Based on users' current experience, the usage of green waste compost on grass, field and protected crops is projected to increase by 135 per cent by 2007 to a value of £552,101 (69,013 tonnes). If quality concerns relating to green waste compost were addressed, the projected growth in the market would increase by 309 per cent. This would take the market to a value of £960,140 (120,018 tonnes).

Based on users' current experience the usage of green waste compost in pot plant and plant propagation would increase by 8 per cent from £4,358 to £4,691 (59,438 litres). If concerns regarding the quality of green compost were addressed the increase in market value is projected to increase to 24 per cent. In this instance the value of the market would increase to £5,407 (68,500 litres).

Based on current experience the total market for green waste compost usage in the organic sector is projected to grow by 133 per cent from £239,383 to £556,793. If quality concerns were addressed the growth in the market by 2007 would be 303 per cent, taking the market from £239,383 to £965,547.

Current *non*-users of composts were also questioned. A lack of confidence in compost quality was identified as the primary barrier to green compost usage. Quality assurance relating to both the source of material and subsequent treatment were important, but levels of contaminants (including heavy metals and GM material) in the final product were also highlighted. Their view was that if quality issues were addressed between 43 per cent (plant propagation and container plant enterprises) and 57 per cent (grass and field crop enterprises) of the respondents would increase usage (or start to use) of green waste compost.

It was found that the peak usage for organic matter in the organic sector varied with enterprise type, with some showing very little annual variation (protected cropping, propagation and container plants) and others showing a lot (field vegetables and fruit). When the sector was studied as a whole, there was a clear peak in early spring followed by a smaller peak in late summer.

The enterprises with the greatest demand for a bought in green waste compost or green waste compost-containing products were those where the production cycle was most intensive and where there was an absence of other abundant, low cost sources of organic matter such as farmyard manure in the case of field crops or alternative substrates like peat and coir for propagation and container plant production. For these reasons the field vegetable, fruit, protected cropping and to a lesser extent container plant enterprises were identified as those with the greatest potential for green waste compost. The majority of these key enterprise types tend to be in the South West, the Midlands and the South East – traditional horticultural areas. From a market perspective it is therefore beneficial to be able to supply to producers in these regions.

The main concerns of grass and field crop end-users were contamination, (genetically modified materials, heavy metals, weeds, pathogens and pesticides), high transport costs and a lack of clarity over the status of green waste derived products relative to organic regulations.

The main concerns of plant propagation and container plant producers were quality, contamination and concerns over the ease of handling these materials compared to peat/coir etc. A lack of familiarity with the product and poor uniformity was also regarded as a barrier.

It is clear that there is significant potential for market growth, based on both existing experience and if end-users' key concerns are addressed. However, it is important that the quality concerns of the organic sector are addressed if maximum market potential is to be realised.

Consultation with suppliers of composted products revealed that 45 per cent were unable to provide an indication of how many of their customers were registered as organic producers. However, suppliers who were producing products that had been certified or approved by one of the organic certification bodies were much more aware of this sector.

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The Waste and Resources Action Programme (WRAP) commissioned the Organic Resource Agency Ltd, the Soil Association Producer Services, Elm Farm Research Centre and the Henry Doubleday Research Association to undertake an assessment of the needs, scale and value of the markets for composted materials and competing products in the UK Organic Farming and Horticulture sector.

The underlying aim was to obtain current, accurate and robust information to provide WRAP with better knowledge of market demand so that it can work to actively develop markets for high quality, high value waste derived products and to stimulate growth in the composting industry.

The work was carried out between October 2003 and February 2004 and focused primarily on a comprehensive postal survey sent to the vast majority of licensed organic farmers and growers in the UK. The key objectives of the survey were as follows:

- Ascertain quantities of different types of organic matter, including green waste composts, used in the organic sector
- Ascertain an approximate market value for green waste compost within the organic farming and growing community
- Identify seasonal fluctuations in the application of organic matter
- Determine the geographic distribution of those organic holdings that are using green waste compost
- Identify the actual and perceived drawbacks to green waste usage
- Investigate the differences in usage of green wastes between different organic enterprises
- Make projections on the future volume and value of the market for green waste compost in the organic sector.

In addition, suppliers of composted products, identified from the responses to the postal questionnaire, were contacted and asked about their views on the markets for composted products and competing products in the sector.

The findings of these surveys form the basis for the following report. The results are discussed and an assessment of current and future issues relating to compost use within the sector is included. A discussion on the survey methodology is also provided and recommendations for future survey work made. Case studies are also included to give 'real-life' examples of compost and organic matter use in the sector.

2. Methodology

2.1 Postal questionnaire sent to organic farmers and growers

The questionnaire consisted of three sections. The first was a general overview of the producer's holding and the enterprises involved, including the types and quantities of organic matter used on the holding. The second and third sections separated those producers who utilised green wastes or composted products derived from green wastes and those who did not.

Because organic producers use organic matter from a range of different sources it was anticipated there might be confusion over which materials were being referred to. Figure 1 illustrates the different types of organic matter that might be used. The letters refer to the references allocated to each group in the questionnaire. This study focused on the quantity and value of ready-made green waste compost use by organic farmers in the UK – category (A).

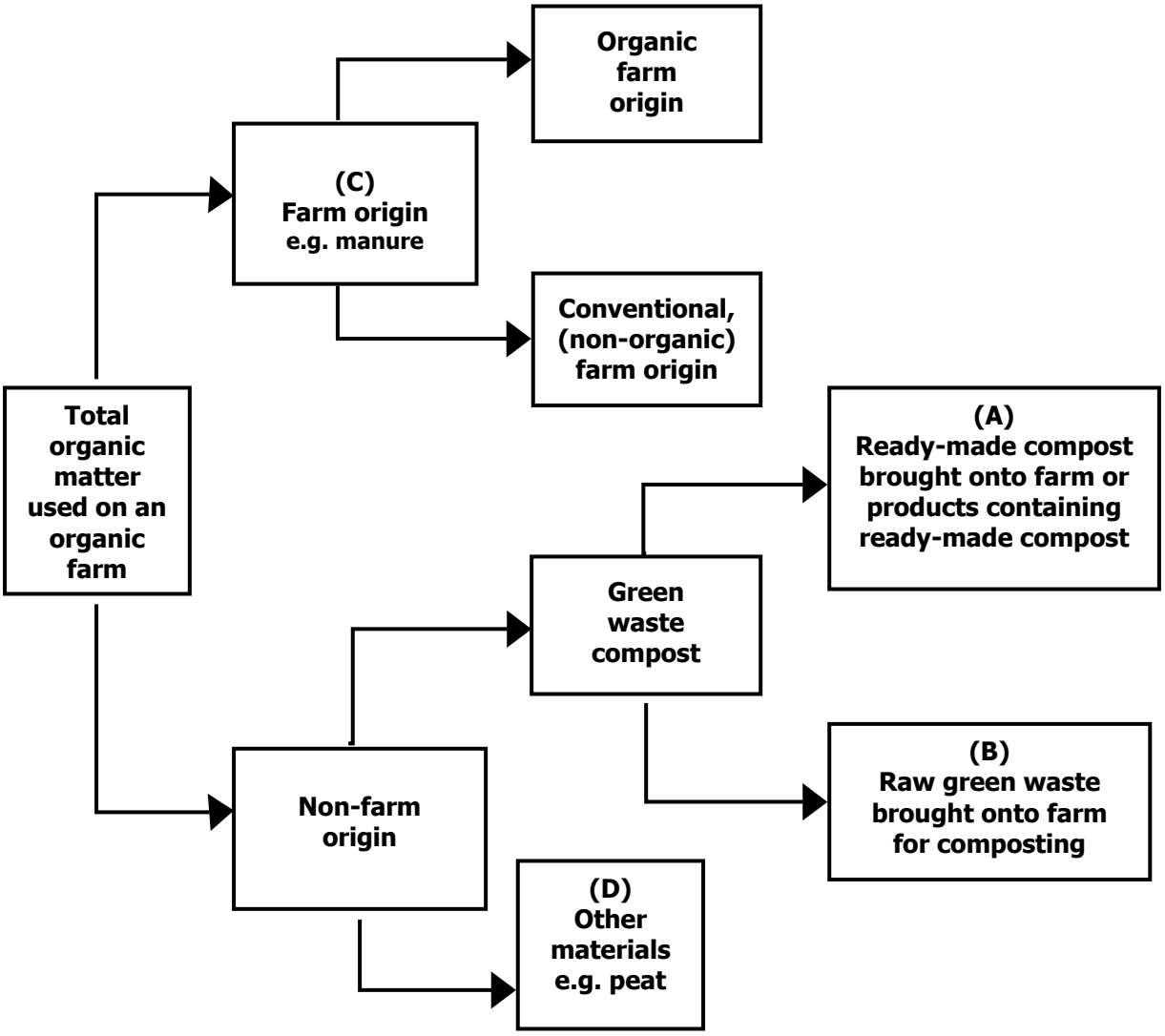


Figure 1. Schematic showing sources or organic matter used by organic farms

The definition of green waste for the questionnaire was carefully defined as the waste from parks, gardens or woodland waste bought onto the holding, this also included vegetable waste from food production or pack houses. Therefore, the definition of green waste compost was defined as compost produced from the above green wastes. Other organic matter of non-agricultural origin included materials like peat, coir and paper mill sludge. The definition of green plant raising media used in the questionnaire was that of a media containing a significant proportion of green waste compost.

Section 2 of the questionnaire was concerned with the type and quantity of green wastes used by the producer and the enterprises involved. Section 2 also made the distinction between green waste composting on-farm and those farms buying in ready-made green waste compost. It is the latter group that represents the current market for green waste compost products i.e. the tonnages of raw waste brought onto farm on-farm composting have been *excluded* from the estimates of market size and value. Users of green waste compost also gave their main reasons for using such products, in addition to any problems encountered or worries concerned with their usage.

The third section dealt with producers who did not use any green waste compost or products containing green waste compost and their reasons for not utilising these products. The last parts of sections 2 & 3 were concerned with pricing information and the change in demand for green waste composts as perceived by the producers.

The questionnaire was sent out to 2,927 licensed organic producers with the Soil Association Certification, Organic Farmers & Growers and the Scottish Organic Producers Association. These certification bodies were chosen because they represented the majority (approximately 94per cent) of all the licensed organic producers in the UK (Table 1). Some members of SOPA were not contacted because they were predominantly Sheep farmers in highland areas which, although representing a large land area, were anticipated to have a negligible requirement for green waste compost.

Table 1. Relative size of organic certification bodies in the UK, December 2002

Certification Body	**Licensed Organic Producers**
Bio-Dynamic Agricultural Association	108
CMi Certification	12
International Certification Service Ltd	0
Irish Organic Farmers and Growers Association	10
Organic Certification Ltd	0
Organic Farmers and Growers Ltd	**945**
Organic Food Federation	105
Organic Trust Ltd	2
Scottish Organic Producers Association	**558**
Soil Association Certification Ltd	**2308**
United Kingdom Register of Organic Food Standards	9
Total	**4057**

Source: DEFRA Statistics Department, 2003. Note some holdings have more than one licence

In all, 405 replies were received and the information from these was used in the compilation of the tables and figures within the report. 57 calls were randomly made to producers to inform them of the project's aims and objectives and to ask for their co-operation in completing the questionnaire. A copy of the full questionnaire is provided in Appendix 1 and the key data from the responses to each question are presented in a set of detailed results tables in Appendix 2.

The comments made by respondents on the questionnaires were taken on board and used to gain some qualitative information about producers' thoughts and attitudes towards green wastes and their composts. In addition, a number of in-depth calls were made to selected producers in different enterprises to ascertain their experiences with green waste composts. These are discussed later in the report.

2.2 Telephone survey of compost suppliers identified in the questionnaire

The responses received to Questions 8 & 9 of the farmers and growers postal questionnaire were used to identify suppliers of composted materials to the sector. Question 8 asked if the farmer bought in 'ready-made' composted products or composted green plant raising media what was it used for, who was the supplier and how much did it cost (including delivery). Question 9 asked for the supplier's contact details, whether they were a producer of compost, a specialist growing media producer, or an intermediary like an agricultural merchant. Having obtained these responses the suppliers were contacted by phone and asked the following questions:

- Please list the growing media, mulch, soil improver and general purpose compost products you produce which you know are certified or evaluated by one of the organic certification organisations (i.e. Soil Association approved/OF&G evaluated)
- Please estimate what proportion of this was sold specifically to ***organic*** farmers or growers if known.
- For each of the above products, please indicate what you perceive will be the trend in the market over the next three years:

    1 Remain the same
    2 Increase by 1-10 per cent,
    3 Increase by 10-25 per cent
    4 Increase more than 25 per cent
    5 Decrease
    6 Don't know

The results of the compost supplier's questionnaire are discussed in section 4.

3. Results of postal questionnaire sent to organic farmers and growers

3.1 Total UK land area used for organic farming and horticulture

The total fully organic land area in the UK as of April 2003 and its distribution across the eight different enterprises is shown in Table 2. This is taken from the Soil Association's *Organic Food and Farming Report 2003* [1]

Table 2. Fully organic land area in the UK, April 2003

	Area (ha)	% of total organic land
Grassland	469,499	87.9
Arable and fodder crops	52,761	9.9
Field vegetables	5,254	1.0
Protected cropping	25	0.0
Top fruit and soft fruit	1,755	0.3
Plant propagation	50	0.0
Container-grown plants	21 producers	-
Woodland	4,923	0.9
Total	534,267	100.0

Table 2 shows fully organic land, i.e. land that has completed the conversion period [2]. Total organic matter usage is based on fully organic land, excluding land in conversion. This decision has been made because expertise in the organic sector suggests that applications of organic matter to 'in-conversion' land is low as this is typically a period when the land is grass and clover.

3.2 Questionnaire returns

Of the 2,927 questionnaires sent out 405, or 14 per cent, were returned.

[1] Haward and Green, Organic Food & Farming Report 2003, Soil Association, Bristol, November 2003.

[2] The term 'conversion' in relation to organic growing refers to the period of time that land formerly used for conventional agriculture or horticulture has to remain free from non-approved inputs (e.g pesticides and chemical fertilisers) before the crops or livestock raised on it can be marketed as organic. The period is typically 2 years.

Table 3 provides information about the number of questionnaires returned from the licensees of each certification body in relation to the total number of questionnaires distributed. The return rate across the licensees for the different certification bodies is similar.

Table 3. Breakdown of returned questionnaires by certification body

	Sent	Returned	% Returned
Soil Association Certification	1,994	280	14
Organic Farmers & Growers	890	117	13
SOPA	43	6	14
Unknown	-	1	-
Total Questionnaires	2,927	405	14

A breakdown of the enterprise types within each certification body and the proportion of returns received, are shown in Table 4. The return rate for each enterprise type varies. The best return was for container grown plants (45 per cent) with the lowest for field vegetables (5 per cent).

Table 4. Breakdown of questionnaire returns by enterprise type

	Sent	Returned	
	Total	**Number**	**%**
Grass / Livestock	2,921	331	11
Arable	1,211	196	16
Field vegetables	1,581	83	5
Protected cropping	378	44	12
Fruit	843	55	7
Plant propagation	253	44	17
Container-grown plants	22	10	45

Note: Many farms are registered for more than one enterprise type

3.3 Current organic matter usage by enterprise type and material

3.3.1 Data from questionnaire returns

Tables 5 and 6 show the amounts of organic matter applied to farms in 2003 from respondents to the questionnaire. The organic matter applied to grass, arable, vegetables, protected cropping and fruit was measured in tonnes, whereas the organic matter used for plant propagation and container plants was measured in litres. These units were regarded as the most commonly used within the two different production sectors.

The application rate of organic matter applied for each different enterprise type is shown in Table 5. Quantities of organic matter for plant propagation and container plants were measured in litres and the ratios that have been calculated are based upon the number of litres of organic matter per plant (Table 6).

Table 5. Amount of organic matter used by questionnaire respondents in 2003 – field based enterprises

	Grass	Arable and fodder crops	Field vegetables	Protected crops	Fruit	Total tonnes on grass and field crops
A/Ready-made compost brought onto farm	62	1,980	1,680	318	212	4,252
B/Materials brought onto farm for composting (non-agricultural)	975	10,400	2,997	12	0	14,384
C/Organic matter from agricultural sources	93,429	43,006	5,886	644	243	143,208
D/Other material	626	410	22	56	-	1,114
Total tonnes	**95,092**	**55,796**	**10,584**	**1,031**	**455**	**162,958**
Land Area of respondents (ha)	**23,569**	**8,730**	**599**	**14**	**196**	**33,108**
Application rate - tonnes/ha	**4.0**	**6.4**	**17.7**	**71.9**	**2.3**	**4.9**

Table 6. Volume of organic matter used by questionnaire respondents in 2003 – pot plant and plant propagation

	Plant propagation	Container plants	Total litres
A/Ready-made compost brought onto farm	6,630	6,500	13,130
B/Materials brought onto farm for composting (non-agricultural)	10,475	-	10,475
C/Organic matter from agricultural sources	551	1,940	2,491
D/Other material	405,626	52,150	457,776
Total volume	**423,282**	**60,590**	**483,872**
Plants nos. grown by respondents	**10,192,650**	**48,650**	**10,241,300**
Application rate - litres/plant	**0.04**	**1.25**	**0.05**

The total organic matter usage from questionnaire returns for field crop production and grass was 162,958 tonnes. A further 483,872 litres was identified as being used in pot plant and plant propagation. For field production, the major type of organic matter used was farm-based organic matter. This accounted for 143,208 tonnes, or 88 per cent of all organic matter used. Green waste compost, both produced on-farm and brought in ready-made, accounted for 11 per cent of all organic matter, at a tonnage used of 18,636 tonnes. 23 per cent of this amount (4,252 tonnes), were ready-made composted products brought onto the farm. The low usage of ready-made green waste compost is thought to be due to a number of reasons. Availability of alternative sources of organic matter is perhaps the most prevalent. In addition where green waste is used, 77 per cent is taken in raw and composted on-farm, probably because it can provide the farmer with additional income via a gate fee (see section 3.5).

3.3.2 Scaled up data to represent the entire UK organic sector

Questionnaire returns were scaled up to account for the entire UK organic sector. For each field-based enterprise type the proportion of land area accounted for by questionnaire returns is detailed in Table 7. For pot plant and propagation, Table 8 shows the numbers of respondents as a proportion of all enterprises licensed within the UK. This data enabled the calculation of a total projected annual tonnage/volume of organic matter used for all UK organic land. Overall the proportion of land represented by the returns for each enterprise type is encouraging. The lowest value of 11 per cent for field vegetable production still provides a good level of information from which an overall estimation of usage can be made.

Table 7. Questionnaire returns as a percentage of total UK organic land area

	Grass	Arable and fodder crops	Field vegetables	Protected crops	Fruit	Subtotal
	Hectares					
Land area of respondents	23,569	8,730	599	14	196	33,108
Total UK land area	83,463	52,761	5,254	25	1,755	143,258
Returns as % total UK land area	28	17	11	57	11	23

Table 8. Questionnaire returns as a percentage of total UK organic plant propagators and pot plant enterprises

	Plant propagation	Container plants	Subtotal
Number of operations that responded	41	10	51
Total organic licensed operations in the UK	253	22	275
Returns as a % of total number of licensed organic enterprises	16	45	19

The actual data from the questionnaire returns illustrated in Tables 5 to 8 have been used to work out the estimated total organic matter usage for the entire organic sector in 2003 (Tables 9 and 10).

The total organic matter usage by the organic sector in 2003 on grass, field and protected crops was 772,671 tonnes (Table 9). The majority of this is organic matter originating from farms such as farmyard manure. Brought in ready - made green compost amounted to 29,378 tonnes, or 4 per cent of all organic matter usage.

The total organic matter usage for pot plant and plant propagation in 2003 was 2,745,255 litres (Table 10). The majority of this (95 per cent) was classified as 'Other' organic matter. 'Other' included materials like peat and coir. Green waste compost only accounted for 55,212 litres or 2 per cent of organic matter used.

Grassland and arable are the largest users of organic matter, with fruit and protected crops being the smallest. However, the proportion of usage of the different types of material for each enterprise types varies for the different enterprise types. The highest percentage of green compost usage is for horticultural enterprises (vegetables, protected cropping, plant propagation and pot plant production). These enterprises have a recognised need for organic matter due to the intensive nature of their operations, and unlike farms do not have ready access to alternatives such as animal manures.

Table 9. Estimated tonnes of different types of organic matter used in the UK organic sector – field based enterprises

	Grass	Arable and fodder crops	Field vegetables	Protected crops	Fruit	Total grass and field crops
A/Ready-made compost brought onto farm	220	11,966	14,729	561	1,902	29,378
B/Materials brought onto farm for composting (non-agricultural)	3,453	62,852	26,283	21	2	92,611
C/Organic matter from agricultural sources	330,852	259,910	51,619	1,134	2,179	645,694
D/Other material	2,217	2,478	193	99	-	4,987
Total tonnes	**336,741**	**337,206**	**92,825**	**1,815**	**4,083**	**772,671**

Note: Figures are derived from actual questionnaire returns scaled up to represent fully organic land in the UK.

Table 10. Estimated volumes of different types of organic matter used in the UK organic sector - pot plants and plant propagation

	Plant propagation (litres)	Container plants (litres)	Total litres
A/Ready-made compost brought onto farm	40,912	14,300	55,212
B/Materials brought onto farm for composting (non-agricultural)	64,638	-	64,638
C/Organic matter from agricultural sources	3,397	4,268	7,665
D/Other material	2,503,009	114,730	2,617,739
Total litres	**2,611,957**	**133,298**	**2,745,255**

It was not possible to quantitatively divide other organic matter of a non-agricultural origin into the specific materials as this was rarely specified on the questionnaire responses. However this does include materials like vegetable pack house waste, coir, and peat.

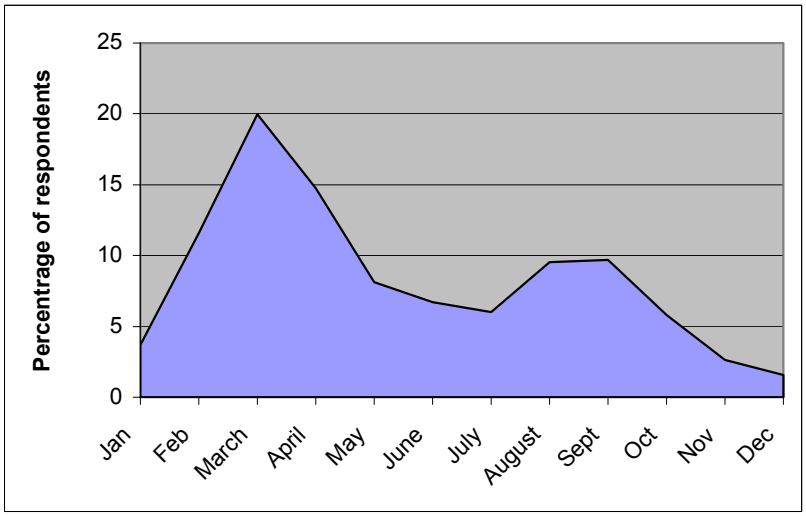
3.4 Seasonality of organic matter use

The questionnaires also investigated the peak usage times for organic matter for the different enterprise types. This data is shown in Table 11. The figures in the table are standardised as percentages of respondents who declared that the month in question was a month of peak demand for them. The peak time for application of organic matter is in the Spring between March and May. Both grass and arable enterprise types have another peak period in August and September, when Autumn applications of organic matter are taking place. Container plants and protected cropping have regular applications of organic matter throughout the year. The cumulative pattern of demand is shown in Figure 2 which clearly illustrates the two peak demand periods within the year.

Table 11. Peak demand for organic matter over the year across all end-user types (% of total responses - figures rounded to whole percentage)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Plant propagation	4	14	23	20	15	6	5	5	4	1	1	1
Fruit	12	24	20	10	4	4	0	0	2	10	10	2
Container	0	12	15	15	12	12	12	12	8	0	4	0
Protected cropping	8	8	8	8	8	8	8	8	8	8	8	8
Field vegetables	8	16	26	19	8	5	2	4	3	4	3	3
Arable and fodder crops	3	12	23	14	6	4	4	12	13	7	1	0
Grass	2	9	17	14	8	9	9	12	11	6	2	1
Average over all enterprises	4	12	20	15	8	7	6	10	10	6	3	2

Figure 2. Peak demand for organic matter over the year - all enterprise types



3.5 Information on current users of green waste compost

Data from the questionnaire revealed that 8.4 per cent of organic farms (34 out of the 405 respondents) brought ready-made green waste compost or green waste compost-containing products onto their holdings. Scaled up to account for organic farms across the UK, this amounted to 246 farms (Table 12).

By tonnage brought in, ready-made green waste compost amounted to 29,378 tonnes for grass and field crop users, or 4 per cent of all organic matter usage. The total organic matter usage for pot plant and plant propagation in 2003 was 2,745,255 litres. The majority of this (95 per cent) was classified as 'Other' organic matter. 'Other' included materials like peat and coir. Green waste compost only accounted for 55,212 litres or 2 per cent of organic matter used.

Table 12. Numbers of farms bringing ready-made green waste compost or green waste compost – containing products onto farm

Total number of UK organic farms included in the survey	2,927
Proportion of total UK organic farms bringing ready-made compost onto the holding (%)	8.3
Number of organic farms bringing ready-made green compost onto holding	246

The amount and type of organic matter used varies between enterprise types. For instance, the number of grass and arable farms buying in ready-made compost is very low in comparison to field vegetables and fruit (Figure 3). This can be attributed to the high use of 'home produced' livestock manure on arable and grassland () and the fact that the economics of using green wastes for these enterprises is not regularly regarded as favourable in relation to other cheaper sources of local organic matter. Figure 3 and Figure 4 show that a small proportion of field vegetable and arable enterprises are producing relatively high volumes of green waste compost through on-farm composting of raw green waste.

Figures 3 and 4 also show that a high percentage of container plant and plant propagating enterprises (50 per cent and 40 per cent respectively – Figure 3) bring both agricultural waste and green waste compost onto the farm. However, the actual volume of green waste compost and agricultural organic matter used by these enterprises is very low (under 5 per cent for plant propagation and under 15 per cent for container plant production – Figure 4). Instead these enterprises rely heavily on 'Other' non-agricultural organic matter – predominantly peat and coir to make up the bulk of the biggest percentage by volume of the organic matter used.

Figure 3. Organic matter usage by enterprise type – percentage of total holdings

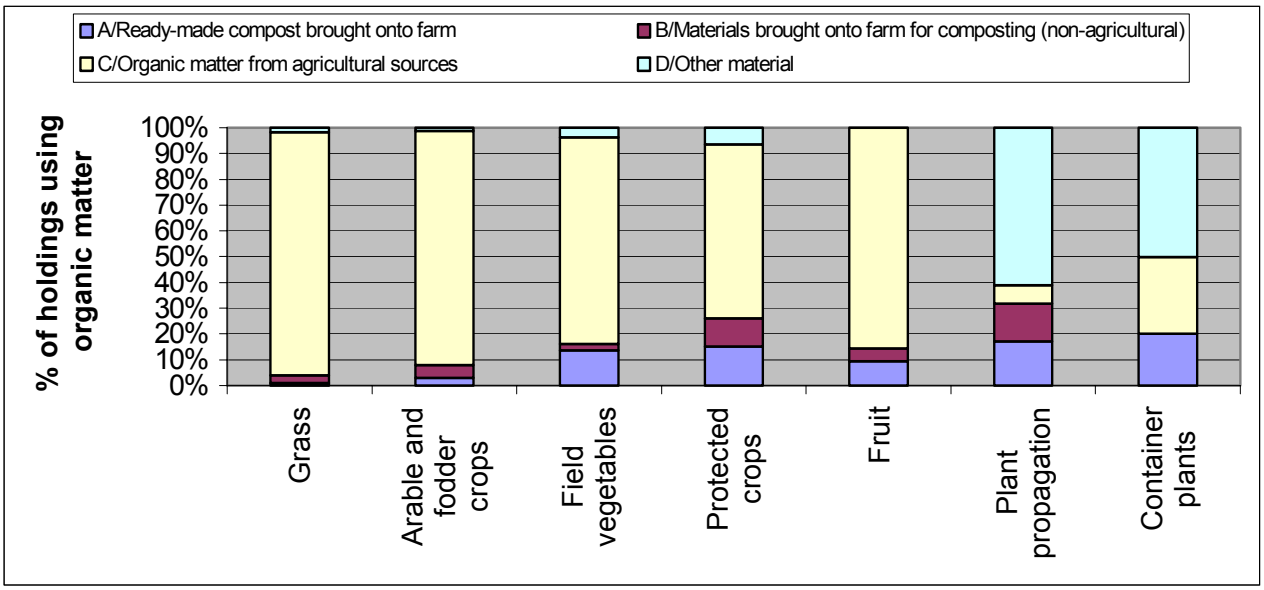


Figure 4. Organic matter usage by enterprise type – percentage by weight/volume used

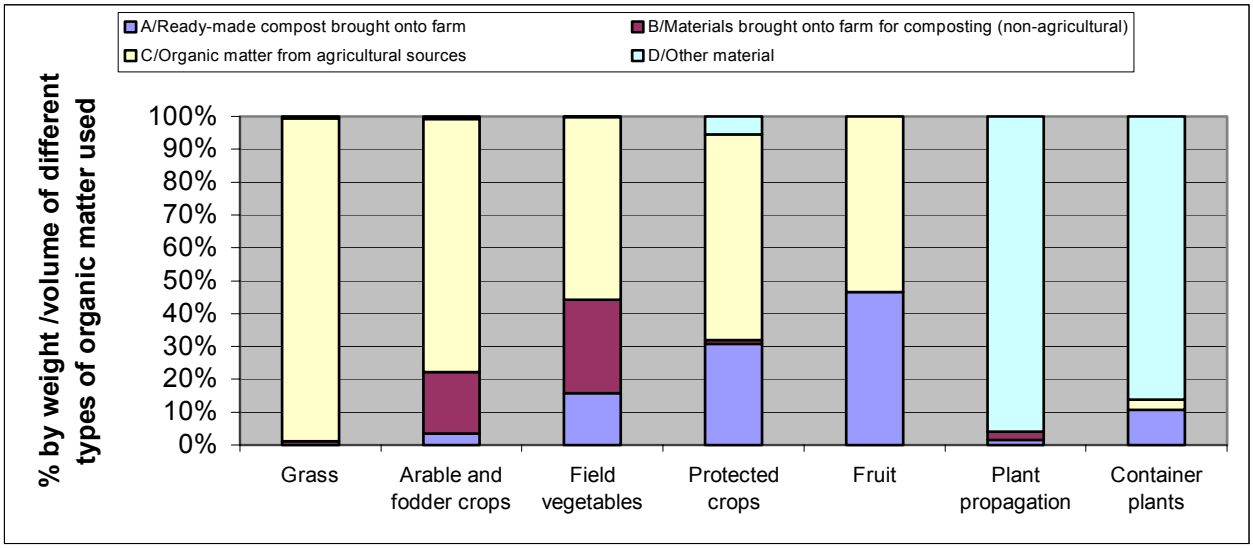


Figure 3 illustrates that the enterprises with the highest number of holdings using ready-made green waste compost are field vegetables, fruit, protected cropping, plant propagation and container plants. Table 13 and Figure 5 show the regional distribution of these enterprises. The majority tend to be in the South West, the Midlands and the South East – traditional horticultural areas. From a market perspective it is therefore beneficial to be able to supply to producers in these regions.

Those using green compost (either composting on-farm or buying in ready-made compost) were asked to score[1] reasons why they used this material. The top reasons selected for each enterprise type are included in Table 14 in order of importance.

Without exception, for the field-based enterprises, soil structural benefits were regarded as the most important quality of green composts. Other important reasons for each of the field-based enterprises are varied but include confidence in the product, cost effectiveness and continuity of supply. For pot plant and propagation, certification by an organic body and confidence in the product are most important.

Users of green compost were also asked what the most important issues were relating to the quality of composted products. Again they were asked to score the importance of a range of statements. Table 15 shows the most important statements in descending order of importance. Freedom from chemical, physical and biological contamination repeatedly came up as the most important quality in compost for use on both field and pot/propagation enterprises.

Table 13. Percentage of key enterprise types present in each region of the UK

	Field vegetables	Fruit	Protected cropping	Plant propagation & container plants	'Overall' percentage for each region based on total key end-users
East	18	18	12	6	13
South East	16	26	19	35	20
South West	23	28	28	59	28
Midlands	25	28	12	18	19
North, Yorkshire and Humberside	7	0	16	18	10
Wales, Scotland, Northern Ireland	11	0	13	12	10

Note: SA Cert holdings only, data unavailable for other certification bodies

[1] Scoring was based on a scale of between 1 and 5 with 1 being of low importance and 5 being very important. The scores for each reason were averaged out and the table only includes reasons that scored on average over 4 i.e. on average respondents regarded them as important (4) or very important (5). These statements have then been listed in the table in descending order of importance

Figure 5. Map showing regional distribution of organic enterprises with the greatest potential for using green waste compost – figures represent overall percentages given in Table 13

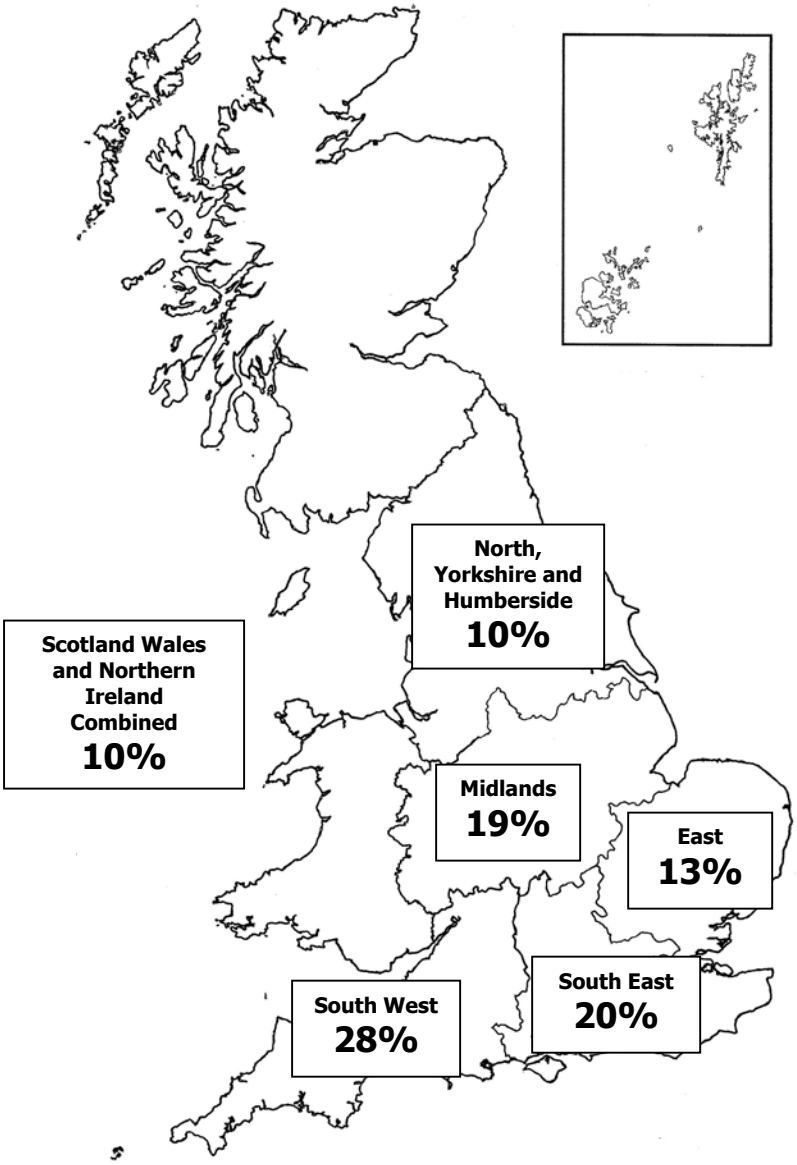


Table 14. Top reasons for choosing to bring green waste compost or green waste compost-containing products onto the farm

Enterprise type	A. Grass	B. Arable and fodder crops	C. Field vegetables	D. Protected cropping	E. Fruit	F. Plant propagation	G. Container plant production
Reasons	• Beneficial to soil structure • Cost Effectiveness • Good continuity of supply • Need for a supplementary nutrient source • Confidence in the product	• Beneficial to soil structure	• Beneficial to soil structure • Cost Effectiveness • Confidence in the product • Good continuity of supply	• Beneficial to soil structure • Cost Effectiveness • Confidence in the product • Good continuity of supply • Proximity of supplier • Need for a supplementary nutrient source	• Beneficial to soil structure • Certification by an organic cert body • Cost Effectiveness • Good continuity of supply	• Confidence in the product • Certification by an organic cert body • Uniformity from batch to batch	• Certification by an organic cert body • Confidence in the product
Sample size	10	20	18	14	9	20	5

Table 15. Most important quality issues for existing users of green waste compost or green waste compost-containing products

Enterprise type	A. Grass	B. Arable and fodder crops	C. Field vegetables	D. Protected cropping	E. Fruit	F. Plant propagation	G. Container plant production
Reasons	• Freedom from physical contamination • Freedom from chemical contamination (heavy metals, pesticides) • Freedom from weed/disease contamination • Nutrient content • Familiarity and Confidence in the product • Transport costs • Freedom from GM • Availability of product information • Disease suppressive properties • Uniformity from batch to batch • Ease of application / handling	• Freedom from chemical contamination (heavy metals, pesticides) • Freedom from physical contamination • Freedom from weed/disease contamination • Cost Effectiveness • Transport costs • Freedom from GM • Nutrient content • Familiarity and Confidence in the product • Continuity of supply • Certification by an organic cert body	• Disease suppressive properties • Freedom from weed/disease contamination • Freedom from chemical contamination (heavy metals, pesticides) • Freedom from GM • Freedom from physical contamination	• Freedom from weed/disease contamination • Other • Freedom from chemical contamination (heavy metals, pesticides) • Nutrient content • Freedom from physical contamination • Cost Effectiveness	• Cost Effectiveness • Freedom from weed/disease contamination • Nutrient content • Freedom from physical contamination • Transport costs	• Freedom from weed/disease contamination • Freedom from GM • Uniformity from batch to batch • Freedom from chemical contamination (heavy metals, pesticides) • Familiarity and Confidence in the product • Freedom from physical contamination • Certification by an organic cert body • Cost effectiveness	• Certification by an organic cert body • Freedom from chemical contamination (heavy metals, pesticides) • Freedom from GM • Familiarity and Confidence in the product • Transport costs • Uniformity from batch to batch • Freedom from weed/disease contamination • Continuity of supply • Nutrient content
Sample size	10	16	18	13	9	21	6

3.6 Market value and projected usage of green waste compost

3.6.1 Current market value

The current estimated market value for green waste compost brought onto organic farms is £239,383[1]. Of this, most of the market value (£235,025) is accounted for by green waste compost applied to grass, field and protected crops (Table 16). The market value for green waste compost used in pot plant production and plant propagation only amounted to £4,358, under 2 per cent of the total market value (Table 17).

For plant propagation and pot plant production the majority of the growing media used was made up of 'other' agricultural material – predominantly peat and coir (Table 18). The market value for 'other' organic matter used in pot plant and plant propagation was £215,884[2], attributing for 98 per cent of the market. This is a potential market growth area for green compost products as coir and peat come under increasing scrutiny regarding the environmental impact of their usage.

Table 16. UK Estimated market value and tonnage for ready-made green waste compost or products containing green waste compost used in grass and field crop production

	Grass	Arable and fodder crops	Field vegetables	Protected crops	Fruit	Total grass and field crops
Current market (tonnage)	220	11,966	14,729	561	1,902	29,378
Current market value (£)	1,756	95,729	117,835	4,486	15,218	235,025

Note: Scaled up for all UK organic farms

Table 17. UK estimated market value and volume for green waste compost or products containing green waste compost used in plant propagation and container plant production

	Plant propagation	Container plant production	Total
Current market (litres)	40,912	14,300	55,212
Current market value (£)	3,229	1,129	4,358

Note: Scaled up for all UK organic farms

Table 18. UK estimated market value and volume for 'Other' non-agricultural organic matter used in plant propagation and container plant production

	Plant propagation	Container plant production	Total
Current market (litres)	2,503,009	114,730	2,617,739
Current market value (£)	206,422	9,462	215,884

Note: Scaled up for all UK organic farms

[1] Current market value based on volumes applied and median price from questionnaires paid for green waste compost of £8/tonne for field based enterprises and 7.9 pence/litre for pot plant and propagating media.

[2] Current market value for the 'Other' category is based on a unit price of 8.2 pence per litre

3.6.2 Future projections

The future market by value and volume has been quantified. The projection is based upon two important assumptions and associated sets of data.

Firstly, the projected market value and volume will increase in line with the projections made by respondants on questionnaire returns.

Secondly, that land currently in conversion will:

- Be fully organic by 2007
- Display the same break down of enterprise types as existing fully organic land

Data from this survey and from the Soil Association's *Organic Food and Farming Report 2003* has been used to quantify this. Please note that there is no conversion period requirement for plant propagation and container plant enterprises.

The questionnaire also asked respondants to give two projections:

- The first based on current experience
- The second if their concerns relating to green waste compost were addressed.

Projections were based upon the increase in usage of composted projects for each holding. This was calculated for each farm bringing in ready-made compost by multiplying their current usage by the percentage projected usage given by the farm in the questionnaire return. These projections are illustrated in Table 19 and Table 20.

Table 19. Estimated 2007 market projections for composted products in grass and field crop production

	Tonnes	Value (£)	% growth in value
1. Current market	29,378	235,025	
2. Projected market for 2007, based upon current experience	51,686	413,487	76
2.b Including land completing conversion (34% increase)	**69,013**	**552,101**	135
3. Projected market for 2007, If concerns over compost quality are addressed	89,885	719,080	206
3.b Including land completing conversion (34% increase)	**120,018**	**960,140**	309

Table 20. Estimated 2007 market projections for composted products in plant propagation and container plant production

	Plant propagation	Container plant production	Total litres	% Growth
	Volume (litres)			
1. Current market	40,912	14,300	55,212	
2. Projected market for 2007, based upon current experience	44,043	15,395	59,438	8
3. Projected market for 2007, If concerns over compost quality are addressed	50,758	17,742	68,500	24
	Value (£)			
1. Current market	3,229	1,129	4,358	
2. Projected market for 2007, based upon current experience	3,476	1,215	4,691	8
3. Projected market for 2007, If concerns over compost are addressed	4,006	1,400	5,407	24

Table 21. Total predicted market value for composted products across all end uses (encompassing land currently in conversion that will be fully organic and used for field crops by 2007)

	Total grass and field crops	Plant propagation	Container plant production	Total	% growth
1. Current market	235,025	3,229	1,129	239,383	
2. Projected market for 2007, based upon current experience	552,101	3,476	1,215	556,793	133
3. Projected market for 2007, If concerns over compost quality are addressed	960,140	4,006	1,400	965,547	303

The total market value for ready-made green waste compost and green waste-containing products across all end uses in 2003 was £239,383 (Table 21). Based on land completing conversion and current experience this is predicted to increase by 133 per cent to £556,793 by 2007. If users concerns regarding the quality of green waste compost products were addressed then the market is projected to grow to £965,547, an increase of 303 per cent. This clearly highlights the importance of developing quality products that organic farmers and growers can be confident in using.

It is also important to note the 2003 market for 'other' non-agricultural materials in pot plant and plant propagation media amounted to an estimated £215,884 in 2003, see Table 18. This is predominantly peat and coir. Both materials are coming under increasing pressure due to environmental concerns relating to their extraction and transportation. This is therefore an area of potential market growth for green waste compost, if high quality can be achieved.

Three additional important factors should be taken into consideration. It was not possible to quantify these within the market projections.

- Regulatory changes - particularly with regards to materials like peat. These may well force organic propagators to think more seriously about sourcing alternatives e.g. green waste compost containing products.

- New producers entering organic farming and producers withdrawing from organic farming - although conversion rates to organic production have slowed in recent years there are still a number of new entrants. The amount of additional organic matter applied when producers currently with land in conversion become fully organic has been factored into the projected market value calculations. However, it is impossible to accurately predict the number of new entrants entering land for conversion in the coming year. It is equally difficult to predict the number of producers that may come out of organic management in the next year

- Existing organic producers who are non-users becoming users. It was impossible from the survey to quantitatively predict how existing non-users of green waste compost may change in the future[1]. However, it would appear that high volumes of green compost are being used on a relatively small number of farms. This suggests that encouraging farms with high demand for a fertility source could lead to significant volumes of green waste compost being used.

3.7 Information on producers not currently using green compost

Section 3 of the questionnaire was filled out by those producers not using green waste compost. This section explored the reasons why these producers didn't use green waste compost and investigated their likely use of this material in the future.

Table 23 shows the most important reasons why these producers are not using such materials. Interestingly the most important reasons are not to do with cost but focus on contamination, with contamination by genetically modified organisms being of particular concern.

[1] Future market projections are based on projection data supplied by existing users of green waste compost.

For arable, grass and field vegetables the main reasons for not currently using green compost are clearly concerns over contamination. For protected cropping and fruit there is a feeling that their existing fertility sources are adequate. For container plant production a range of reasons were quoted for not using it including lack of confidence in the product, lack of product information, and poor uniformity.

These respondents were asked if their usage of green composts was likely to increase in the future based firstly on existing experience and secondly if the product quality issues were addressed to try to meet their needs. The proportion of respondents indicating an increase in use for the different enterprise types are shown in Table 22.

Table 22. Indicative change in the use of green waste compost in 2007 by farmers not currently bringing green waste compost onto the farm

Grass and field crops				**Plant propagation and container plant production**			
a) % Usage based on current experience		b) % Usage if concerns over quality were overcome		a) % Responses based on current experience		b) % Responses if concerns over quality were overcome (plant propagation/container plants)	
Stay the same	79%	Stay the same	43%	Stay the same	86%	Stay the same	57%
Increase	21%	Increase	57%	Increase	14%	Increase	43%
Sample size	279	Sample size	243	Sample size	22	Sample size	21

For all enterprise types, a much higher proportion expressed a willingness to use green waste compost if some or all of their key concerns could be overcome. The potential for these current non-users to actually become users *is not* included in the projections in Section 3.6.2 because of the difficulty in quantifying the above data with any degree of reliability. Nevertheless, given sufficient quality assurance and education regarding the product, it seems likely that there is potential for growth of the green waste compost market amongst current non-users, especially in the grass and field crop end-users groups.

Table 23. The most important reasons why different producers didn't use green waste compost

Enterprise type	A. Grass	B. Arable and fodder crops	C. Field vegetables	D. Protected cropping	E. Fruit	F. Plant propagation	G. Container plant production
Reasons	• Presence of GM • Presence of chemical contaminati on (heavy metals, pesticides) • Presence of weeds, pests & pathogens	• Presence of GM • Presence of chemical contamination (heavy metals, pesticides) • Presence of weeds, pests & pathogens • High Transport costs • Uncertain about status with organic cert bodies	• Presence of GM • Uncertain about status with organic cert bodies • Presence of chemical contamination (heavy metals, pesticides) • Existing fertility/organic matter supplies are sufficient	• Existing fertility/organic matter supplies are sufficient	• Existing fertility/organic matter supplies are sufficient	• Other	• Presence of physical contaminants • Presence of weeds, pests & pathogens • Presence of chemical contamination (heavy metals, pesticides) • Presence of GM • Poor Water holding capacity • Difficult to apply/handle • Lack of familiarity and confidence in the product • High transport costs • Poor uniformity from batch to batch • Lack of product information • Uncertain about status with organic cert bodies
Sample size	195	118	30	13	18	12	3

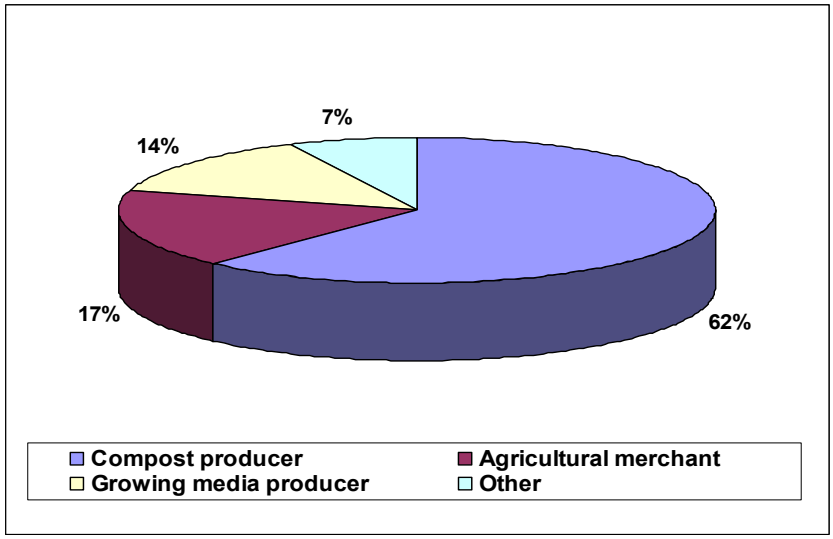
4. Results of compost suppliers questionnaire

- 2,927 questionnaires were sent to individual licensees
- 405 responses from individual licensees were returned
- 48 of the individual licensees bought ready-made composts/growing media onto their holdings
- 34 different suppliers were identified from the 48 licensees who utilised bought-in composted products and growing media
- 29 suppliers were contacted and asked to take part in the supplier questionnaire (of the remaining 5, one had gone out of business and no phone details had been provided, nor could they be obtained for the other four).

The suppliers contacted are listed in Appendix 5. The majority were actual producers of green composts i.e. they sold directly to the farmers or growers, the remainder were categorised as merchants/suppliers, specialist growing media manufacturers or 'others'. The two suppliers in the 'other' category were producers of organically approved mushroom compost for organic mushroom production.

It was evident from the list of suppliers, that a number of key green waste producers and growing media manufacturers were not included. This did not mean that these do not supply to the organic sector, simply that they were not identified in the 405 responses obtained from the farmers and growers questionnaire.

Figure 6. Types of firm who supply ready-made composts or growing media to organic farmers and growers



65.5 per cent of the 29 suppliers contacted supplied products already approved or evaluated by one or more of the certification bodies and 34.5 per cent supplied non-evaluated products (see Table 24)

Of the 29 suppliers contacted 13 (44.8 per cent) were unable to give any indication of the tonnage/volumes of product that were sold specifically into the organic sector. The principle reason for this lack of information was simply that they did not know which of their customers were licensed organic producers. This was either because they did not have the means to track customer type or their view of the potential of the 'organic' market in particular was unclear.

16 of the 29 suppliers (55.2 per cent) were able to provide information on the tonnage or volumes of material currently sold into the organic sector. These included 13 suppliers of approved/evaluated materials and 3 suppliers on non-approved materials. The only non-certified material identified was green compost – no non certified propagation, growing media or other products were listed. Those suppliers selling approved/evaluated products had a much greater depth of knowledge over which of their customers were organic farmers and growers and also what issues were

important to the sector. Based on these findings it was possible to calculate an average price (including delivery) that farmers and growers were prepared to pay for the different categories of material (Table 25) although conclusions need to be made with caution because of the small sample size (see footnotes).

Table 24. Breakdown of certified and non-certified products

	Soil Improvers /Mulches	Propagation / Growing Media	Other[1]	Total
Certified / evaluated and approved [2]	8 (27.6%)	9 (31.0%)	2 (6.9%)	19 (65.5%)
Not certified / not evaluated or approved	10 (34.5%)	0 (0.0%)	0 (0.0%)	10 (34.5%)
				29 (100%)

Table 25. Average price (including delivery) of different categories of composted products and growing media based on suppliers questionnaire results

Category	Sample Size	Average Price Delivered
Soil Improver /Mulch - Certified / Evaluated and Approved	4	£11.15 / tonne
Soil Improver /Mulch - Not certified / Evaluated or Approved	3	£4.22[3] / tonne
Propagation / Growing Media - Certified / Evaluated and Approved	7	£59.25 /m^3 (6p/litre)
Propagation / Growing Media - Not Certified / Evaluated and Approved	0	-
Other products - Certified / Evaluated and Approved	2	£179.29 / tonne[4]
Other products - Not Certified / Evaluated and Approved	0	-

The range of responses illustrates a mixed view of the future market. The only clear conclusion is that none of the suppliers questioned thought it was going to decrease. 17 per cent didn't know what the market was going to do. This was due to the fact that a number of suppliers were unaware which of their customers were organic producers. Of those that gave an opinion, the majority suppliers thought that the market would remain static (27 per cent) or increase by up to 10 per cent (27 per cent). Again the small sample size meant that these conclusions should be used with caution.

[1] Mushroom compost specifically for mushroom production

[2] Approval or evaluation of a composted product indicates a product and its production process has been examined by the certification body and has been shown to be compliant. A farmer or grower may nevertheless still be expected to seek permission from the certification body before they can use it on their holding. Non certified products can also be used with permission but the farmer or grower will have to supply more information to the certification body regarding its suitability relative to a similar certified product.

[3] This is an average of three values, two of which were zero, because green compost was being applied to organic land free of charge as part of trials work or because of the need to dispose of surplus material. This leads to a low average price paid but does not necessarily indicate a lower value product simply because it is not certified.

[4] This is an average of two values both obtained from suppliers of organic mushroom compost for organic mushroom production

Table 26. Responses regarding perception of future market for composted products in the organic sector

Response	No. of responses	No. of responses as % of total
A. Remain the same	8	26.7
B. Increase by 1-10%	8	26.7
C. Increase by 11-25%	6	20.0
D. Increase by >25%	3	10.0
E. Decrease	0	0.0
F. Don't Know	5	16.7

5. Case studies

5.1 Case Study: Project Carrot

Carrot is a partnership between the Bulmer Foundation, the Pershore Group of Colleges and Advantage West Midlands. It came together in 2000 in response to the crisis in farming and the need to find a new, more sustainable, direction for rural land use. The project originated in Herefordshire, but it is hoped that its impact will be felt regionally and nationally. The Project seeks to encourage a transformation in understanding which puts sustainable land management at the heart of rural regeneration thinking.

The project is based at Holme Lacey College near Hereford and it is on the college farm that considerable developments in on-farm composting have taken place. Two years ago the project began composting farmyard manure on a modest scale and has now developed the system to the point where a range of materials is composted using a covered windrow system based on the CMC (Controlled Microbial Composting) approach.

The feedstock for the rows includes farmyard manure, straw based horse manure, green and woody material from the college grounds, spent hops, apple pomace, and occasionally green material cut from set-aside land. High clay content soil is included to make up 5-10 per cent of the mix. A field site is used as the cost of establishing a concrete handling area lies well beyond the project's means. The risk of leaching is minimal as the activity of the composting process tends to dry the rows out to the extent that water has to be added. Crop-tex covers are used to keep the rain off while allowing the compost rows to breathe.

No inoculant is used and temperature and carbon dioxide are monitored on a daily basis. Activity develops rapidly and the rows are turned when the temperature reaches 65^{o}C – each row is likely to be turned some 12-20 times over the six weeks required to produce compost. A windrow turner is used with a roller that passes the covers over the machine as the row is turned. This clearly requires considerable time and capital inputs so the expense will need to be justified.

The system is producing 700-800 tonnes of finished compost at the present time and this is spread on to grassland or prior to potatoes. It is too early to judge the benefits to soil and plants but the quality of the finished material is exceptional even when the process is slower than usual. As noted, the operation is expensive, a factor that may be difficult to justify in some farming systems. There are some systems for which composting may be essential and these could include horticultural systems – the temperatures that are consistently achieved in the windrows should help to allay concerns about the application of such composts in advance of vegetable or salad crops. Observations of field performance have so far been ad hoc but crop trials are planned in the future.

5.2 Case Study: Langmead Farms

Langmead Farms is a major producer and packer of fresh and prepared salads with sites in the UK and abroad. The great majority of the produce is supplied to multiple retailers and the food service sector. In 2000 the decision was taken to move into the production of organic salad and baby leaf crops. A significant area of land near Petworth in West Sussex is now producing a range of crops of which lettuce (iceberg, Romaine, little gem) and baby leaf spinach are the most significant. Wheat is included in the rotation along with fertility building breaks. A number of minor crops are being developed including radish, celery, salad onions and sweet corn.

The soils on the Petworth land are light sandy loams with relatively low organic matter levels. It was decided to respond when the local council invited tenders for green waste handling. The production of significant volumes of green waste compost on-site was seen as providing a useful source of nutrients for the organic crops and it was hoped that the use of such compost would help to build up organic matter levels in the light sandy soils.

It was not possible to establish a licensed site at the time but the company has been running an exempt site on a field for the last two years. An application to establish a licensed site has been accepted and work on the construction of a concrete pad and associated facilities will start this year. The main feedstock is typical municipal green waste such as prunings, park trimmings, annual plants from the park beds, leaves, etc. This material is shredded down to 2 centimetres and set out in 40 metre windrows. The use of clay loam and lettuce waste in the mix helps to produce a better product but it is more costly

The current method of turning uses a front bucket loader though investment in a compost turner will be considered once the licensed site is up and running. The temperature of the windrows is monitored on a daily basis in line with the PAS 100 towards which the company is trying to work. The quantity of material produced varies according to the amount of

feedstock supplied by the local council – 8,000 tonnes was received in 2003. The licensed site will be able to handle up to 25,000 tonnes annually and throughput will have to approach this figure for the process to be viable.

The finished material is applied to cropping ground after oversized material is removed. The oversized material is returned to new windrows and has the effect of re-inoculating new material. The pH of the compost is relatively high (7-8) but this is seen as an advantage as the soils require regular inputs of lime. It is estimated that the liming requirement is reduced by 10 per cent through the use of the green waste compost. Conductivity and salt content are low. Observations of the crops that have received compost inputs have indicated improved quality and processibility. These aspects are difficult to measure though yield increases of 35 per cent have been recorded albeit on a small sample.

Tom Weinert, Langmead's organic manager, is keen to carry out trials and is also interested in designing composts for different end-uses possibly through the use of different inoculants. The possibility of peat replacement in the media used to raise transplants is also being examined. Discussions are taking place with the propagator to increase the level of interest. In essence the story is 'so far, so good' but it will be important to demonstrate the costs and benefits to the parent company to keep the process going.

5.3 Case Study: Delfland Plants

Delfland Nurseries is a family business owned and run by husband and wife team John Overvoorde and Jill Vaughan. John has been involved in plant raising for over 25 years and this year will be their seventh season as Soil Association registered plant raisers. Their customers range from some of the largest producers in the UK right down to the smaller consumer and all receive their very best service.

Delfland are specialists in outdoor vegetable plants requiring heated propagation and lights such as celery and celeriac; endive, chicory and fennel; leeks and onions; Chinese leaves and herbs. In addition, for glasshouses and poly-tunnels, they grow tomatoes, cucumbers, peppers and aubergines. 40 million transplants are produced each year of which roughly one-third are organically raised.

The company relies on bought-in substrates for its production because consistency is absolutely essential to success in a business that has to deliver quality transplants to precise deadlines. The suppliers of the substrates are developing peat-reduced materials using green waste compost and wood fibre. So far there has been no deterioration of plant quality but a problem was encountered with the production of blocks.

The customers for block transplants have very strict requirements as they use semi-automatic planters to establish significant areas of crops. It has so far proved impossible to produce a block containing green waste compost that satisfies the customers' requirements. The mix is too granular to achieve the precise shape and stability necessary for machine planting.

In principle Delfland would use green waste compost in module substrates but they are concerned about the risks of carry-over of clubroot to brassica transplants in particular. The main use of reduced peat substrates is therefore focused on the production of plants in pots such as the tomatoes, cucumbers, etc. Delfland cautiously welcome continued development in the use of green waste compost in propagative mixes but as with many other propagators they will continue to seek assurances on the carry-over of disease and weeds.

5.4 Case Study: Robert Thomas Farms

Robert Thomas Farms (RTF) is a major grower of root crops (carrots, parsnips, etc.) based at Heywood Oaks, North of Nottingham and supplying the multiples and wholesale markets. As for many other significant conventional growers a decision was made to include organic production in the company portfolio in the late 1990s. There were a number of fields that were due to come out of a Nitrate Sensitive Area (NSA) agreement and these were put into organic conversion. The company now has some 140ha of land under organic management and grows a range of crops including onions, carrots, parsnips, leeks, courgettes, runner beans and brassicas.

The company also produces conventional pigs and also established an organic pig operation though this has been dropped due to lack of viable prices. There is therefore a significant supply of manure available on-site for use on the organic land. This was initially 'composted' by stacking but after attending a course, company staff decided to implement a windrow composting system to process the manure. Green waste compost was considered but there were no schemes in the area so a manure only process was established. This is in contrast to the other case studies discussed in this report but illustrates the fact that the techniques can be applied to a range of feedstocks.

The NSA soils are light sandy loams and are likely to benefit from regular applications of stable organic material. The composting operation is carried out in field corners and is moved every year to avoid excessive soil structure damage. A

compost turner is used on the uncovered windrows – there has been no evidence of leaching as the windrows tend to dry out with the temperatures that are generated. Crop wastes and residues could be incorporated in the mix in due course.

Staff at RTF have seen significant improvements in crop health and yields since the composted material has been used – the first application was made in 2002. The finished material is easy to handle and can be applied more evenly than stacked manure. There has been no detailed monitoring, but the process is seen as crucial in maintaining yields and soil condition. This has been a major step for the company and the investment involved is being closely tracked to ensure the benefits justify the cost.

5.5 Case Study: Jekka's Herbs

Jekka's Herb Farm started 19 years ago in the back garden of a house in Bristol. The company moved 17 years ago to its present site North of the city. The farm has always been organic, and is Soil Association certified. It was the first certified organic farm to be awarded a Chelsea Flower Show Gold Medal, back in 1995, and has won 7 further Chelsea gold medals since.

At its height, the business was producing up to half a million plants mainly for the wholesale market but this became difficult when supermarkets and others preferred to source cheaper plants from abroad. The main business now is the production of up to 200,000 containerised herb plants for sale to a wide range of customers through a thriving mail order business that runs for most of the year. More than 450 varieties are grown on the farm, and the company is always on the look-out for new and interesting plants to grow. A number of associated activities support the main business and these include open days, workshops, a garden planning service, and attendance at a range of shows around the country.

Initially production ran at relatively low levels and the compost used in the beginning was based on green waste compost. Problems were created through 'slumping' and poor drainage of the medium and it was not possible to source materials such as composted bark to provide a more open structure. Peat-based substrates were used for a number of years then the company moved back to substrates containing green waste compost some five years ago. It is part of the ethos of the organisation to continually explore sustainable methods of production.

The current substrate is essentially a mix of composted bark and 20 per cent green waste compost supplied by a major producer of bark-based products. This is used for all aspects of the operation including propagation, annuals and perennials – it is sometimes mixed with perlite for propagation. It generally gives good results and no problems with pH or conductivity have been encountered.

The one area where problems have been encountered involves over-wintered plants and plants potted up in January/February. As the temperature increases in Spring these particular plants exhibit conditions of extreme nitrogen deficiency due to what is presumed to be lock-up. The mechanism is not clear but it appears that the microbes that have lain relatively dormant in the cool of winter experience a population explosion with the rising temperatures with a consequent high demand for nitrogen. This problem is not seen at any other time of year.

A number of options are being explored to remedy this problem. These include the development of a mix containing loam that has proved reasonably successful though the quality issues are still being worked on. The use of permitted liquid feeds does not alleviate the problem though the addition of the permitted fertilisers on-site has helped. A further option that will be examined is to bring in mature, stable, green waste compost and composted bark for on-site mixing. The use of 'young', active green waste compost that has not completed its full cycle could be a contributory factor.

The business will continue to use substrates containing green waste compost in conjunction with an ongoing development programme. There may be opportunities for the sharing of knowledge and experiences from other situations that could shed some light on the lock-up problem. The situation has changed out of all recognition since the first herb plants were produced 20 years ago.

5.6 Case Study: Wight Salads

Wight Salads is a wholly privately-owned company growing and marketing speciality organic and conventional tomatoes from the Isle of Wight, mainland UK, Portugal and Spain. The range of crops runs from super-sweet cherry to rich full-flavoured beefsteak tomatoes. Organic production is focused at the Isle of Wight sites and began in 1997 using 0.2ha glasshouses as a test-bed site. Organic English tomatoes are currently available from February through until November

Production of organic protected crops on this scale represented a pioneering step and provided a basis for a continuing programme of development and expansion. This has led to a position in 2003 where there is over 8ha of glasshouse organic tomato production (including a brand new 3ha organic glasshouse) that supplies the needs of most major UK multiples. This represents a substantial investment programme and a strong commitment to organic production.

Building soil fertility and vitality in these protected cropping areas was the first priority as the demands of a long season tomato crop are high. The decision was taken to focus on the use of compost as the main provider of crop nutrition and soil organic matter. Since 1998 the main source has been green waste compost brought in from both Island Waste Services and Hampshire Waste Services. The rates of application vary according to a detailed assessment of soil fertility and comprehensive nutrient budgeting.

The company has also been developing its own on-site composting technique. This process has been developed gradually to make absolutely sure that the risk of disease carry-over is effectively zero. At present, a large amount of nutrient rich, quality controlled compost is produced on-site each year using waste tomato leaf and haulm with imported horse manure. The system uses a windrow with breathable covers approach that involves regular turning.

In general terms Wight Salads has been very satisfied with the results. The green waste compost is an excellent soil conditioner and has lifted soil organic matter levels significantly. Crop yields have been consistently good and it is clear that there is a high level of biological activity in the soil. On the down-side there is some concern about the high pH of the compost as the typical glasshouse crops such as tomatoes and cucumbers prefer a neutral to slightly acid soil. Inputs of the imported compost are restricted because of concerns over lead levels.

The intention is to continue composting plant waste produced during the year and then the whole tomato plant at the end of the season. This is possible because of the use of 100 per cent bio-degradable string in the production areas.

6. Conclusions and recommendations

6.1 Key findings

6.1.1 Farmer and grower questionnaire

The size of the market for green waste composted products used by the organic sector in 2003 was £239,383. The total tonnage of brought-in, ready-made green waste compost used on grass, field and protected crop production was 29,378 tonnes. A further 55,212 litres of green waste compost or green waste containing products was bought in for use in pot plant production and plant propagation.

Current end-users of green waste compost products were asked how they perceived their use of these products might increase by 2007 if a) quality remained the same and b) if their key quality issues were addressed.

Based on users, current experience the usage of green waste compost on grass, field and protected crops is projected to increase by 135 per cent by 2007 to a value of £552,101. If quality concerns relating to green waste compost were addressed the projected growth in the market would increase to 206 per cent. This would take the market to a value of £719,080.

Based on users, current experience the usage of green waste compost in pot plant and plant propagation would increase by 8 per cent from £4,358 to £4,691. If concerns regarding the quality of green compost were addressed the increase in market value is projected to increase to 24 per cent. In this instance the value of the market would increase to £5,407.

Based on current experience the total market for green waste compost usage in the organic sector is projected to grow by 133 per cent from £239,383 to £556,793. If quality concerns were addressed the growth in the market would by 2007 would be 303 per cent, taking the market from £239,383 to £965,547.

Current *non*-users of composts were also questioned. A lack of confidence in compost quality was identified as the primary barrier to green compost usage. Quality assurance relating to both the source of material and subsequent treatment were important, but levels of contaminants (including heavy metals and GM material) in the final product were also highlighted. Their view was that if quality issues were addressed between 43 per cent (plant propagation and container plant enterprises) and 57 per cent (grass and field crop enterprises) of the respondents would start to use or increase usage of green waste compost.

It was found that the peak usage for organic matter in the organic sector varied with enterprise type, with some showing very little annual variation (protected cropping, propagation and container plants) and others showing a lot (field vegetables and fruit). When the sector was studied as a whole, there was a clear peak in early Spring followed by a smaller peak in late Summer.

The enterprises with the greatest demand for a bought-in green waste compost or green waste compost-containing products were those where the production cycle was most intensive and where there was an absence of other abundant, low-cost sources of organic matter such as farmyard manure in the case of field crops or alternative substrates like peat and coir for propagation and container plant production. For these reasons the field vegetable, fruit, protected cropping and to a lesser extent container plant enterprises were identified as those with the greatest potential for green waste compost. The majority of these key enterprise types tend to be in the South West, the Midlands and the South East – traditional horticultural areas. From a market perspective it is therefore beneficial to be able to supply to producers in these regions.

It is clear that there is significant potential for market growth, based on both existing experience and if end-users key concerns are addressed. However, it is important that the quality concerns of the organic sector are addressed if maximum market potential is to be realised.

6.1.2 Supplier questionnaire

Over 40 per cent of the suppliers identified as supplying into the organic sector were either unaware of which of their customers were organic farmers and growers, or even if they did, they did not have ready access to the proportion of their sales that this sector represented. Some suppliers indicated they simply weren't able to record details of their customer base with their existing marketing methods, whilst others were unaware of the characteristics and value of the 'organic' market. In contrast some of the suppliers (namely the specialist plant raising media producers and the

mushroom compost producers) were very aware of the 'organic' market. They were quick to identify themselves with the organic certification/approval status awarded to their products by the organic certification bodies.

The small sample size meant that it was difficult to draw conclusions regarding the significance in terms of value of selling certified vs. non-certified products mainly because only in the case of soil conditioners/mulches was the data available to make a comparison. Here it appeared that the certified products commanded a higher price, but this was due primarily to anomalies in two out of the three entries that made up this section.

In terms of the suppliers' view of the size of the market for composted products in the organic sector in the future, the majority believe it will remain as it is at present or increase by between 1 per cent and 10 per cent over the next three years.

6.2 Drivers and barriers relating to use of composted products in the organic sector

It is clear from the responses to the farmers and growers questionnaire that the organic sector has specific needs in terms of organic matter usage and equally specific *concerns* over using composted products to meet these needs. Nevertheless, the findings from the questionnaire indicate a broadly positive attitude to using composted products.

The following sections outline the main issues relating to the use of green waste derived composts, considering the two broad groups of users separately (since they have very different issues to consider).

6.2.1 Field crops

Current main worries:

- GM contamination,
- Contamination (heavy metals, weeds pathogens and pesticides),
- High transport costs,
- Uncertainty about the organic status of green waste compost.

6.2.1.1 Factors affecting the future market:

- **Changes in the area organically farmed.** If this increases, then the demand for compost is likely to increase.
- **Landfill tax**. Increases to landfill tax could make compost cheaper to buy in or make on-farm composting more economic. Although cost did not appear as severe a drawback as expected in the survey it would certainly be easier to market if it were more price competitive.
- **Changes in the organic regulations**. It is currently acceptable for farmers to buy-in conventionally produced manure (currently approximately 60,000 tonnes annually, according to the survey). Before use it must be stacked for 6 months or actively composted for 3 months. Because it is difficult to justify an organic agricultural sector supported by fertility from conventional farming these regulations are likely to be tightened in the future (similar regulations with regard to the import of animal feed have already been changed). Green waste compost would be an obvious substitute for this material because its 'recycled' nature fits well with the aims of organic agriculture.
- **Changes to the Waste Management Licensing Regulations 1994.** This piece of legislation is due to be amended during 2004 and it is expected that this will have a big impact on small – medium scale composting operations currently operating under exemption certificates. The amount of material that can be stored and composted on site at any one time in an exempted operation is likely to be reduced under the new regulations. This may dissuade farmers from undertaking on-farm composting because above this new lower threshold, composters will have to apply for, and operate under, a full waste management licence which carries with it more stringent controls and higher costs. The scale of the impact of this regulatory change on the market for ready-made green waste compost by the organic sector is difficult to predict. It may make more farmers and growers seek alternative sources of ready-made composts in place of the material formerly made on-farm, but it may equally result in some producers embracing the problem, diverting resources into larger, fully licensed on-farm composting facilities and increasing the tonnages of on-farm compost made, along with the gate fees the raw waste would be able to command.

Nitrate Vulnerable Zone regulations. The implementation of Nitrate Vulnerable Zone regulations will restrict the use of manure in much of the country at certain times of the year. The aim of this is to reduce the nitrate contamination of groundwater and many of the measures already form part of good organic farming practices. However, since the nitrogen in composts is in a very stable form and not likely to result in leaching some farmers may choose to use this material as an alternative.

- **Quality issues**. Contamination issues figured highly in the list of reasons for not using green waste compost. This is partially a matter of perception and there will always be some people who will never use it regardless of the evidence. As the PAS 100 specifications for compost become more widely understood some of these concerns may be reduced. The issue of GM contamination is linked to the demand by regulatory bodies for producers to provide documentation that no GM containing material is brought into the holdings. How important this will become in the future depends upon how widespread GM use becomes in conventional agriculture. The concerns may, in fact, stimulate the acceptability of green waste compost if it becomes more difficult to source animal manures that are not contaminated or potentially contaminated.

6.2.2 Container growers and plant propagators

Current main worries:

- Contamination (heavy metals, weeds pathogens and pesticides),
- GM contamination,
- Difficulty of handling and unfamiliarity with the product,
- Poor uniformity,
- High transport costs,
- Uncertainty about the organic status of green waste compost.

6.2.2.1 Factors affecting the future market:

- **Alternatives to peat versus fitness for purpose.** Plant propagators and plant raisers currently rely far less on green waste compost than do the field crop producers. However this does not mean that they form an obvious market because they have much more demanding needs. This is reflected by their stated concerns over difficulty of handling and unfamiliarity with the product. Green waste compost is not generally suitable for use as a growing media on its own and requires careful blending in order to tailor it to the needs of particular crops. A uniform product is particularly important.
- **Organic regulations.** The organic farming regulations have only recently been extended to cover containerised production of ornamental plants in the UK. The details have not yet been finalised and it is possible that they may demand a certain minimum content of recycled materials. This may stimulate the green waste compost market.
- **Key quality criteria.** Growers listed many concerns over contamination as reasons for not using green waste compost more. The issue of plant diseases is particularly important for producers of module-raised plants destined for planting out in the field as the customers may not want to run the risk of infecting their land with, e.g. onion white rot. Better certification (e.g. the PAS 100 regulations) may improve quality but greater monitoring will add to the price.

6.3 Qualitative information and comments from respondents to the farmers questionnaire

There was some lack of confidence amongst producers about the finished product not being properly 'finished' prior to delivery. Comments included "compost was hot when it arrived" and a "black mound was delivered", in both cases the producers had to finish the composting themselves.

Heterogeneity in the finished product was seen as a key barrier to use for plant propagators and container plant producers. "Peat is the only product we can use for blocked vegetables. It is easy to handle and predictable". This producer cited their customers further down the supply chain as being of great importance.

There was an uncertainty relating to the organic status of green wastes and composts, with producers concerned about the level of chemicals persisting in the green waste products despite composting.

Availability was a universal concern for producers with either sources of green wastes or the finished products being too far away from their farms. Most producers felt that transport costs "are the real issue." Most were willing to either compost or use the green waste finished products if the supply was local.

There was a split between producers over willingness to pay for green waste compost products; generally grassland and arable producers were not willing to pay for the products often comparing them against materials like sewage sludge

and stable manure which are mostly free. In contrast vegetable growers, plant propagation and container plant producers were prepared to pay for green waste compost products. Producers hoped that they "would pay pro rata for the nutrient value" of green waste products.

"I was very pleased with the compost from X and will use it again. Service and transport was very good, but I did buy in bulk and I thought the price was competitive." Some producers are happy with using green waste products and with the service they have received from suppliers. On the other hand, there are producers who thought "the cost of delivered compost is too high at present" and some had problems with limited space to accommodate the delivery vehicles. In this case the producer had to "arrange their own haulage", which increased the cost "3-4 fold".

Another negative view related to a concern from an organic farmer with livestock also growing vegetables who was concerned that "If sufficient quantity of composted product were available we can see specialist stockless farms (without livestock) producing vegetables at a low cost taking our markets".

6.3.1 Grass and arable only enterprises

Most grassland and arable producers said there was no need for extra organic matter because the farm was self contained and sufficient farmyard manure was produced. Sustainable organic farming was cited by some producers as being of great importance, any extra fertility additions being against organic farming principles.

Lack of knowledge about quality, availability and price of green waste products was mentioned by producers from all enterprises, but mostly from producers in the grassland and arable sectors.

Some producers from the grassland and arable sector were "willing to compost Local Authority green waste if it was allowed and available", on their land, but only if it was free of charge. This view was taken because the "council's wish to dispose of these wastes." Another producer Mr MacKay said "he was quite prepared to distribute any finished green waste compost back out to local people".

6.3.2 Plant propagators and container plant production enterprises only

A number of producers in the plant propagation and container plant sector were willing to invest in compost making facilities to compost green wastes. The reasons given for this were that "there is no organic farmyard manure available locally" and "green wastes collected by the council are readily available."

Factors of concern to plant propagation producers included the "need to supply derogations each time", "any new legislation covering organic inputs, would make our enterprise unfit for organic farm use, is pretty scary", and "the associated costs and paperwork' of using composted green wastes.

6.4 A critique of the survey methodology

6.4.1 Strengths

- The questionnaire was very comprehensive in terms of the level of information requested of respondents, enabling a wide range of statistics to be extracted. This data is valuable because it is not something that has been attempted in this specific sector to the same degree before.
- There were very few complaints about the nature and aims of the questionnaire suggesting that producers are sympathetic to the aims of the project and that the questionnaire was well designed. This is encouraging given the complexity of the data being gathered.
- The contact with all organic producers via the questionnaire helped to raise awareness of the project and WRAP's aims and objectives. In doing so the project has acted as a good exercise in raising awareness alongside gathering important data.
- Return rates were optimised through the provision of telephone help lines which were being run by the Soil Association as a matter of course throughout the working week. Producers who had received the questionnaire were able to call up at any time to seek guidance on filling it in or to find out more about the project. This helped to get a good return rate and to reassure producers of the value of the project.
- There are a number of fields of data that have been generated via the questionnaire. For the project a series of linked Excel spreadsheets was satisfactory to extract the information required. However, it would be valuable to develop a database that enables more sophisticated searching of the data if the project is to be repeated in the future. For example to enable users to easily search for green compost users, in the south west, that pay more than £10/tonne for the material they buy in. It is proposed that WRAP explore developing such a database in collaboration with the project team

- The project team had a good level of knowledge and experience in organic practices, the organic market and organic land area. This helped to ensure that interpretation of statistics and assumptions employed were technically sound.

6.4.2 Weaknesses

- The quantitative data within the report is based on a voluntary questionnaire. The return rate at 14 per cent is positive but does however require assumptions to be made to account for the remaining non-respondents.
- The extent of the questionnaire (required to obtain all the statistics required) may have put some producers off and as such lowered the return rate.
- Data provided by the questionnaire on future usage and cost of materials was sparse and somewhat varied. The project team felt that this was the weakest area in terms of data confidence and suggest that the way that price and projection data is obtained in the future may need to be reviewed.
- In order to account for land that will complete conversion in the coming years, assumptions had to be made. These were based on land completing conversion to become fully organic receiving the same application of organic matter as existing organic land.
- The project could not predict the potential of a sudden increase in land entering conversion or conversely the implications of a fall in the number of organic producers.
- It was clear from some of the responses that some people had misinterpreted certain questions. This was due in part to the complicated nature of the questions being asked but also to the terminology used. Future work should ensure as far as possible that questionnaires and surveys avoid jargon and use unambiguous terminology to reduce confusion.
- The supplier questionnaire was based solely on those suppliers identified from the farmers and growers questionnaire. This resulted in a small sample size which meant that the data produced had to be viewed with caution. In particular, a number of large green waste producers were not identified as suppliers to the organic sector in the farmers and growers survey and hence the data that they could have provided (which was likely to involve a significant portion of green waste compost supply) was omitted. Future contact with suppliers should be more comprehensive.

6 Appendices

Appendix 1. Farmer and grower questionnaire

Questionnaire for organic farmers and growers to assess existing use of, and future needs for composted products*

This questionnaire consists of 3 sections. It is not as arduous as it looks at first glance!

Section 1: to be filled in by all organic producers. It relates to general farm details and sources and volumes of all organic matter inputs used on the holding.

Section 2: to be filled in only by organic producers bringing composted products* or green wastes* on to the holding.

Section 3: is to be filled in only by organic producers not bringing composted products or green wastes onto their holding.

*See definition below

Definitions

- Organic matter: straw, manure, etc (but not including material deposited directly from grazing animals)
- Green wastes: plant/vegetable wastes such as source separated parks, gardens and woodland waste and vegetable waste from vegetable food production/pack houses etc. It does not include meat or fish containing wastes, kitchen waste or wastes from supermarkets or catering establishments.
- Composted products: compost produced from green waste (see above) used as a soil improver or mulch
- Green plant raising media: growing media for use in container plant production, produced either wholly or containing a significant proportion of green compost (see above)
- Active composting: an active process of composting where the heap/windrow is turned regularly. The process involves a heat build up phase followed by a maturation phase resulting in a pest and pathogen-free, stabilised product.

If you should have any questions regarding the form please contact Michael Green at the Soil Association on 0117 314 5187

Section 1.Whole farm questions

Q1. Farm details

Contact name :		Organic Certification Body (Please tick)	
		A) SA Cert	
Farm name :		B) OF&G	
Address :		C) SOPA	
:			
:		Total hectares organically managed	_____ ha
Post code* :		Total hectares in-conversion	_____ ha
		Total hectares fully organic	_____ ha
Phone number :		Number of years under organic management	_____ years

*Post code is very important for analysis of data - please ensure it is completed

Q2. Please provide an approximate breakdown of your fully organic land by area (ha) for each of the enterprises listed in the table. For propagation and container plant production please state the approximate number of plants produced per year.

	Enterprise type/land use						
	Grass	Arable and fodder crops	Field vegetables	Protected cropping	Top and soft fruit	Plant propagation (approx. no. of plants produced/year	Container plant production (approx. no. of plants produced/year
Hectares of fully organic land or number of plants produced							
						Is this the main focus of your business? Y / N	Is this the main focus of your business? Y/ N

Q3. How many tonnes of organic matter in total were applied across the whole farm in the year 2003?

_____tonnes

Q4. Of the organic matter in Q3, what tonnage from the different sources listed below was used on the different enterprises operational on your holding in 2003?

		Tonnes of compost applied (or *litres* used for container production and propagation)						
Type of organic matter applied/used		Grass	Arable and fodder crops	Field vegetables	Protected cropping	Top and soft fruit	Plant propagation (Litres used in 2003)	Container plant production (Litres used in 2003)
Composted products or compost containing products. Please specify:								
Organic matter originating from organic farms (including your own). Please specify:								
Organic matter originating from non-organic farms. Please specify:								
Other non-agricultural or horticultural organic matter	1. Peat							
	2. Coir							
	3. Paper sludge							
	4. Other, please specify							

Q5. Please indicate how your peak demand for organic matter varies over the course of the year for the different enterprise types by ticking the appropriate boxes

	Peak Demand for Organic Matter by Month											
Enterprise Type	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Plant propagation												
Top and soft fruit												
Container plants												
Protected cropping												
Field vegetables												
Arable and fodder crops												
Grass												

Section 2. Questions relating to the use of composted products, products derived from composts or raw green waste brought onto farm for composting

Please complete this section only if you are bringing composted products or green wastes on to the holding
IF YOU DO NOT BRING GREEN WASTE OR COMPOSTED PRODUCTS ONTO YOUR HOLDING PLEASE MOVE TO SECTION 3

Q6. a) Do you bring 'ready-made' composted products on to the farm? Y / N If YES, please go to Question 8, If NO, please go to Question 6(b)

b) Do you bring in raw green waste materials and compost them on-farm? Y / N If YES, please go to Question 7. If NO, please go to Sect. 3, Q15

Q7. What non-agricultural materials were used in the compost you made on-farm in 2003 and in what quantities?
Please complete the table below and continue with Q8

	Tick (if used)	Approximate tonnage of compost produced
Green waste		
Waste from vegetable food packers/processors		
Stable yard waste		
Paper waste		
Other. Please state:		

Q8. If you bought in 'ready-made' composted products or composted green plant raising media what was it used for, who was the supplier and what was the price (inc. delivery)?
Please complete the table below and continue with Q9

Material	Purpose (please tick)	Supplier	Price £/tonne
1.	Soil improvement Mulching Plant propagation media Container production		
2.	Soil improvement Mulching Plant propagation media Container production		

Q9. For each supplier of green compost listed in Question 8, please provide the following information:

Supplier 1	Supplier 2
Name:	Name:
Address:	Address:
Phone Number:	Phone Number:
Type of supplier (Please tick)	Type of supplier (please tick)
Compost producer	Compost producer
Agricultural or Horticultural Merchant/Supplier	Agricultural or Horticultural Merchant/Supplier
Specialist plant-raising media manufacturer	Specialist plant-raising media manufacturer
Other (please state) …….	Other (please state) …….

Please continue with Q10.

Q10. Why did you choose to use composted products or products containing compost?
For each of the enterprises relevant to you, please score the importance of each of the following statements:

	Score 1 – 5 (1=totally unimportant, 2=unimportant, 3=neither important nor unimportant, 4=important, 5=very important)						
Statements	Grass	Arable and fodder crops	Field vegetables	Protected cropping	Top and soft fruit	Plant propagation	Container plant production
Cost effectiveness							
Confidence in the product							
Uniformity from batch to batch							
Proximity of supplier							
Available product information							
Good continuity of supply							
Certified by organic certification body							
Need for a supplementary nutrient source							
Potential to suppress disease							
Beneficial to soil structure							
Regulatory pressures to use green compost							
Lack of alternative fertility sources							
Receiving gate fee to compost green waste							
Other - please list:							

Q11. What are the most important issues relating to composted products quality that you think still need to be addressed? For each of the enterprises relevant to you, please score the importance of each of the following statements:

	Score 1 – 5 (1=totally unimportant, 2=unimportant, 3=neither important nor unimportant, 4=important, 5=very important)						
Statements	Grass	Arable and fodder crops	Field vegetables	Protected cropping	Top and soft fruit	Plant propagation (m^3 used)	Container plant production (m^3 used)
Cost effectiveness							
Familiarity and confidence in the product							
Uniformity from batch to batch							
Freedom from physical contamination (metal, glass, plastics, etc)							
Freedom from weed / disease contamination							
Freedom from chemical contamination (heavy metals, pesticides)							
Freedom from genetically modified material							
Transport costs							
Water holding capacity							
Ease of application/handling							
Availability of product information							
Continuity of supply							
Certification by an organic certification body							
Nutrient content							
Disease suppressive properties							
Other: (Please list)							

Q12. Based on your response to Q11, would you be willing to pay for such a product? Y / N

Q13. What would be the maximum amount you would pay (including delivery)? _____ £/tonne
or for container plant production or propagation _____ £/100 litres

Q14. How do you envisage your usage of composted products and other organic materials changing in the future i.e. over the next 3 years? Please complete the table below:

		On grass, field and protected crop production		In plant propagation or container plant production		Non-agricultural organic matter Peat / coir / paper sludge / other (delete as applicable)	
	Change by 2007	Tick	% change	Tick	% change	Tick	% change
A) Based on current experience	Increase						
	Decrease						
	Stay the same						
B) If it met your requirements detailed in question 11.	Increase						
	Decrease						
	Stay the same						

If you have any additional comments please include these under Q18.

Please return the completed questionnaire by Monday 17 November 2003 to:
Michael Green, Soil Association, Bristol House, 40-56 Victoria Street, Bristol, BS1 6BY. Fax 0117 925 2504

Thank you very much for your time

Section 3.

For those producers not bringing composted products or green wastes onto their holding.

Q15. Why DON'T you use composted products or green plant raising media? Please score the importance of each of the following issues for the enterprises relevant to you

	Score 1 – 5 (1=totally unimportant, 2=unimportant, 3=neither important nor unimportant, 4=important, 5=very important)						
Statements	Grass	Arable and fodder crops	Field vegetables	Protected cropping	Top and soft fruit	Plant propagation	Container plant production
Poor cost effectiveness							
Lack of familiarity and confidence in product							
Poor uniformity from batch to batch							
Presence of physical contaminants							
Presence of weeds, pests and pathogens							
Presence of chemical contaminants (heavy metals/pesticides)							
Presence of genetically modified materials							
High Transport costs							
Poor water holding capacity							
Difficult to apply/handle							
Lack of product information							
Poor availability / continuity of supply							
Uncertain about status with organic certification bodies							
Inadequate source of nutrients							
Existing fertility/organic matter supplies sufficient							
Other (please state)							

Q16. How do you envisage your usage of composted products changing in the future i.e. over the next the next 3 years? Please complete the table below:

	On grass, field and protected crop production			In plant propagation or container plant production		
	Change by 2007			Change by 2007		
		Tick where applicable	% of organic matter application		Tick where applicable	% of organic matter application
A) Based on current experience?	Increase			Increase		
	Stay the same			Stay the same		
B) If the concerns you identified in Question 14 were overcome?	Increase			Increase		
	Stay the same			Stay the same		

Q17. What would be the maximum price that you would be willing to pay for a composted product (including delivery), if the concerns you identified in question 15 were overcome? _____£/tonne

or, for container plant production or propagation: _____£/100 litres

Q18. Any additional comments:

Please return the completed questionnaire by Monday 17 November 2003 to:
Michael Green, Soil Association, Bristol House, 40-56 Victoria Street, Bristol, BS1 6BY. Fax 0117 925 2504

Thank you very much for your time

Appendix 2. Tables of data from farmer and grower questionnaire

Table 1. Questionnaire returns – by certification body (Qu.1)

	Sent	Returned	% Returned
SA Certification	1,994	280	14
Organic Farmers &Growers	890	117	13
Scottish Organic Producers Association	43	6	14
Unknown	-	1	-
Total Questionnaires	**2,927**	**405**	**14**

Table 2. Questionnaire returns – by enterprise type (Qu.1)

	Sent				Returned	
	SA Cert.	OF&G	SOPA	Total	Number	%
Grass / Livestock	2,028	876	17	2,921	331	11
Arable	815	383	13	1,211	196	16
Field vegetables	1,464	102	15	1,581	83	5
Protected cropping	370	8		378	44	12
Fruit	789	54		843	55	7
Plant propagation	248	5		253	44	17
Container plants	21	1		22	10	45
Total	**5,735**	**1,429**	**45**	**7,209**	**763**	**11**

Note: Scottish producers only have a horticulture category, so this has not been broken down beyond 'field vegetables'.
Note: Many farms are registered for more than one enterprise type. Numbers refer to registered organic land, not application of organic matter

Table 3. Land area of respondents by enterprise type (Qu.2)

	Grass	**Arable**	**Field Vegetables**	**Protected Cropping**	**Fruit**	**Total tonnes**	**Plant propagation (litres)**	**Container plants (litres)**	**Total litres**
Land area of respondents	23,569	8,730	599	14	196	**33,108**	10,192,650	48,650	**10,241,300**
Total UK land area	83,463	52,761	5,254	25	1,755	**143,258**	253	22	**275**
Returns as % total UK land area	28	17	11	57	11	**23**	17	45	**19**
% land area by type - returns	71	26	2	0	1	**100**			
% land area by type - UK total	58	37	4	0	1	**100**			
Application rate (Tonnes or litres/ha)	4	6	18	72	2	**5**	0.04	1.25	**0.05**

Note: No land area data is available for plant propagation or container plants, so figures refer to licensed organic producers instead.

Table 4. Number of respondents applying organic matter (Qu.2 & 3)

	Grass	Arable and fodder crops	Field vegetables	Protected crops	Fruit	**Total grass and field crops**	Plant propagation	Container plants	**Sub Total**
A/Ready-made compost brought onto farm	2	5	11	7	2	22	7	2	9
B/Materials brought onto farm for composting (non-agricultural)	7	8	2	5	1	23	6	-	6
C/Organic matter from agricultural sources	215	149	64	31	18	477	3	3	6
D/Other material	4	2	3	3	-	12	25	5	30
Total holdings	**228**	**164**	**80**	**46**	**21**	**534**	**41**	**10**	**51**

Table 5. Amount of organic matter used by respondents by enterprise type (Qu.3)

	Grass	**Arable and fodder crops**	**Field vegetables**	**Protected crops**	**Fruit**	**Total tonnes on grass and field crops**	**Plant propagation**	**Container plants**	**Total litres**
A/Ready-made compost brought onto farm	62	1,980	1,680	318	212	4,252	6,630	6,500	13,130
B/Materials brought onto farm for composting (non-agricultural)	975	10,400	2,997	12	0	14,384	10,475	-	10,475
C/Organic matter from agricultural sources	93,429	43,006	5,886	644	243	143,208	551	1,940	2,491
D/Other material	626	410	22	56	-	1,114	405,626	52,150	457,776
Total tonnes	**95,092**	**55,796**	**10,584**	**1,031**	**455**	**162,958**	**423,282**	**60,590**	**483,872**
Application rate - tonnes/ha or litres/plant	**4.0**	**6.4**	**17.7**	**71.9**	**2.3**	**4.9**	**0.04**	**1.25**	**0.05**

Table 6. Number of respondents bringing ready-made composted products onto the farm (Q6.a)

	Number bringing materials onto farm	% of all 405 respondents
No. bringing ready-made compost onto farm	29	7
No. bringing ready-made compost onto farm - no volume data	5	1
Total bringing ready-made compost onto farm	34	8

Table 7. Number of respondents bringing ready-made composted products or material to compost on-farm (Qu.6)

	Number bringing materials onto farm	% of total respondents
No. bringing ready-made compost onto farm	47	11.6
No. bringing raw green waste to compost on-farm	19	4.7
No. bringing 'other' non agricultural materials onto the farm	4	1.0
Total bringing materials onto farm	70	17.3

Table 8. Number of respondents bringing green compost and green materials onto farm – by enterprise type (Qu.6)

	Number bringing ready-made compost onto farm	% within each enterprise type	Total no of questionnaire returns	% of each enterprise type bringing ready-made compost onto farm
Grass	2	6	331	1
Arable	5	14	196	3
Field vegetables	11	31	83	13
Protected crops	7	19	44	16
Fruit	2	6	55	4
Plant propagation	7	19	44	16
Container plant production	2	6	10	20

Table 9. The usage of ready-made composted products bought onto farms (Qu.8)

Purpose	No. of respondents
Soil Improvement	20
Mulching	7
Plant Propagation	10
Container Plants	5
Sample Size	34

Table 10. Reasons for choosing composted products or products containing compost (Qu.10)

	a/Grass		b/Arable		c/Field Vegetables		d/Protected Cropping		e/Fruit		f/Plant prop		g/Container Plants	
	No. responses	Ave. Score	No. responses	Ave. Score	No. responses	Ave. Score	No. responses	Ave. Score	No. responses	Ave. Score	No. responses	Ave. Score	No. responses	Ave. Score
1. Cost Effectiveness	9	4.2	17	3.9	15	4.4	13	4.7	8	4.3	18	3.4	4	3.3
2. Confidence in the product	9	4.0	18	3.9	16	4.3	13	4.4	8	3.5	20	4.4	4	4.0
3. Uniformity from batch to batch	9	3.8	17	3.2	15	3.9	13	3.7	8	2.5	19	4.1	4	3.5
4. Proximity of supplier	8	3.1	16	3.6	16	3.8	14	4.1	8	3.9	15	2.7	4	3.3
5. Available product information	9	3.9	18	3.3	14	3.7	12	3.3	7	3.0	15	3.5	4	3.0
6. Good continuity of supply	9	4.2	18	3.3	15	4.0	13	4.2	8	4.3	19	3.9	4	3.3
7. Certification by an organic cert. body	9	3.7	19	3.6	16	3.9	13	3.6	7	4.3	20	4.4	5	5.0
8. Need for a supplementary nutrient source	10	4.2	19	3.7	17	3.9	14	4.1	7	3.4	14	2.8	4	2.8
9. Disease suppressive properties	9	3.1	19	2.6	18	3.7	14	3.9	8	2.8	14	2.9	4	2.5
10. Beneficial to soil structure	9	4.6	20	4.4	18	4.6	14	4.8	8	4.8	12	2.0	3	2.0
11. Regulatory pressures to use green compost	7	2.6	18	2.1	14	2.4	12	2.3	7	2.1	13	1.9	5	2.2
12. Lack of alternative fertility sources	9	3.1	19	3.6	16	2.9	12	3.2	9	3.4	13	2.3	4	2.8
13. Receiving gate fee to compost green waste	8	2.6	19	3.0	11	1.6	10	1.7	6	1.5	12	1.4	3	1.7
14. Other	0	0.0	2	3.0	2	4.0	1	4.0	0	0	1	1.0	0	0

Table 11. Important issues relating to composted products quality that respondents think need to be addressed (Qu.11)

	a/Grass		b/Arable		c/Field Vegetables		d/Protected Cropping		e/Fruit		f/Plant Prop		g/Container Plants	
	No. responses	Avg Score	No. responses	Avg Score	No. responses	Avg Score	No. responses	Avg Score	No. responses	Avg Score	No. responses	Avg Score	No. responses	Avg Score
Cost Effectiveness	8	3.4	14	4.6	17	3.8	13	4.0	9	4.2	21	4.2	6	3.7
Familiarity and Confidence in the product	8	4.4	13	4.2	16	3.8	11	3.6	8	3.8	19	4.4	6	4.3
Uniformity from batch to batch	8	4.0	13	3.6	16	3.8	11	3.7	8	3.4	19	4.5	6	4.2
Freedom from physical contamination	10	4.9	15	4.7	18	4.1	13	4.1	9	4.0	20	4.4	6	3.8
Freedom from weed & disease contamination	10	4.8	15	4.7	18	4.5	12	4.6	9	4.2	20	4.7	6	4.2
Freedom from chemical contamination	10	4.9	15	4.9	18	4.3	13	4.3	8	3.9	20	4.5	6	4.5
Freedom from GM	10	4.3	15	4.4	17	4.2	13	3.8	8	2.9	19	4.6	6	4.5
Transport costs	10	4.4	14	4.4	17	3.8	12	3.8	8	4.0	18	3.8	5	4.2
Water holding capacity	8	3.3	13	3.4	16	3.3	11	3.2	8	3.3	18	3.9	6	3.7
Ease of application/handling	10	4.0	14	3.9	17	3.5	13	3.6	8	3.8	20	3.8	6	3.8
Availability of product information	8	4.1	13	3.8	16	3.3	11	3.3	8	3.5	18	3.8	6	3.8
Continuity of supply	9	3.8	16	3.9	16	3.6	11	3.5	8	3.8	18	3.9	6	4.2
Certification by an organic cert. body	9	3.8	13	4.0	17	3.7	12	3.3	8	3.0	19	4.3	6	4.8
Nutrient content	10	4.5	15	4.3	17	3.9	13	4.2	8	4.1	19	4.0	6	4.0
Disease suppressive properties	9	4.2	14	3.4	2	4.5	12	3.9	8	3.4	17	3.5	4	3.3
Other	0	0	0	0	0	0	2	4.5	0	0	1	5.0	0	0

Table 12. Respondents bringing composted products or products containing compost onto farms who are willing to pay for them (Qu.12)

	Number of responses	**%**
Farmers willing to pay for such products	43	84
Farmers NOT willing to pay for such products	7	14
Unspecified	1	2
Total responses	**51**	**100**

Table 13, Projected use of composted products by 2007 - farmers bringing materials onto farm (Qu.14)

Grass and field crops				Plant propagation and container plant production			
a) Usage based on current experience	No. responses	**b) Usage if requirements in Q11 were overcome**	No. responses	**a) Usage based on current experience**	No. responses	**b) Usage if requirements in Q11 were overcome**	No. responses
Stay the same	13	Stay the same	15	Stay the same	20	Stay the same	23
Increase	15	Increase	14	Increase	8	Increase	5
Decrease	1	Decrease		Decrease	1	Decrease	1
Sample size	**29**	**Sample size**	**29**	**Sample size**	**29**	**Sample size**	**29**

Table 14. Concerns of respondents not using composted products or green raising media on their farms (Qu.15)

	a/Grass		b/Arable		c/Field Vegetables		d/Protected Cropping		e/Fruit		f/Plant Propagation		g/Container Plants	
	No. responses	Ave. Score	No. responses	Ave. Score	No. responses	Ave. Score	No. responses	Ave. Score	No. responses	Ave. Score	No. responses	Ave. Score	No. responses	Ave. Score
1. Poor cost Effectiveness	162	3.6	95	3.6	22	3.4	10	2.6	14	3.2	11	3.3	2	3.0
2. Lack of familiarity and Confidence in the product	161	3.3	105	3.6	26	3.8	10	3.0	11	3.0	12	3.6	2	4.5
3. Poor uniformity from batch to batch	144	2.8	89	3.1	19	3.0	10	2.9	10	2.6	11	3.7	2	4.0
4. Presence of physical contaminants	150	3.7	93	3.9	22	3.8	9	3.1	10	2.9	10	3.8	2	5.0
5. Presence of weeds, pests & pathogens	154	4.0	94	4.2	21	3.9	10	3.1	13	3.0	12	3.7	1	5.0
6. Presence of chemical contamination (heavy metals, pesticides)	159	4.2	97	4.4	21	4.1	9	3.3	13	3.4	11	3.7	1	5.0
7. Presence of GM	156	4.3	95	4.5	23	4.2	10	3.4	11	3.8	10	3.5	1	5.0
8. High Transport costs	168	3.9	100	4.0	22	3.8	11	3.4	12	3.7	11	3.3	2	4.5
9. Poor Water holding capacity	142	2.6	88	2.6	18	2.9	8	2.6	10	2.9	11	3.7	1	5.0
10. Difficult to apply/handle	146	2.9	90	2.9	18	2.7	8	2.5	11	3.3	9	3.3	1	5.0
11. Lack of product information	165	3.8	109	3.9	23	3.7	10	3.0	13	3.7	12	3.2	2	4.0
12. Poor availability / Continuity of supply	160	3.6	104	3.8	25	3.6	10	2.6	11	3.0	11	3.2	2	2.0
13. Uncertain about status with organic cert. bodies	171	3.9	104	4.0	28	4.1	11	3.5	13	3.8	11	3.9	2	4.0
14. Inadequate source of nutrients	144	3.3	92	3.5	17	3.1	7	2.7	9	3.0	9	3.6	0	0.0
15. Existing fertility/organic matter supplies are sufficient	195	3.9	118	3.7	30	4.1	13	4.3	18	4.2	10	3.2	3	3.0
16. Other	17	4.7	12	4.3	3	4.7	1	4.0	3	3.7	2	4.5	2	4.0

Table 15. How do respondents, who do not use composts, envisage the change in the use of these products in the future (Qu.16)

Grass and field crops				Plant propagation and container plant production			
a) Usage based on current experience	No. responses	**b) Usage if concerns in Q15 were overcome**	No. responses	**a) Responses based on current experience**	No. responses	**b) Responses if concerns in Q15 were overcome**	No. responses
Stay the same	221	Stay the same	105	Stay the same	19	Stay the same	12
Increase	58	Increase	138	Increase	3	Increase	9
Sample size	279	Sample size	243	Sample size	22	Sample size	21

Appendix 3. List of suppliers of composted products to the organic sector identified in the responses to the farmers and growers questionnaire

Name	Category
Avoncrop	Agricultural or horticultural merchant/supplier
Cardiganshire Farmers Co-op	Agricultural or horticultural merchant/supplier
Chase Organics	Agricultural or horticultural merchant/supplier
Wrights	Agricultural or horticultural merchant/supplier
Tamar Organics	Agricultural or horticultural merchant/supplier
Shanks	Compost producer
7Y (Bioganix)	Compost producer
Boathouse Organic Farm	Compost producer
C.D.V.	Compost producer
Capel Mushrooms	Compost producer
Cheshire County Council	Compost producer
County Mulch	Compost producer
Department of Agriculture & Fisheries	Compost producer
Eco Composting	Compost producer
Ecological Sciences Ltd	Compost producer
Environmental Projects Agency Ltd	Compost producer
Mercia Waste	Compost producer
Robert Thomas Farms	Compost producer
Scarborough Borough Council	Compost producer
Waste Recycling Group	Compost producer
Wyvern Waste	Compost producer
Waste Recycling Group Plc.	Compost producer
Worton-farm	Compost producer
Agricultural Supply Co.	Other (Mushroom compost producer)
Tunnel Tech Ltd	Other (Mushroom compost producer)
Fertile Fibre	Specialist plant raising media manufacturer
West Riding Organics	Specialist plant raising media manufacturer
Monro South	Specialist plant raising media manufacturer
Sinclair	Specialist plant raising media manufacturer