



The State of Composting in the UK

2001/02

Report by

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I Executive summary

The Composting Association has conducted surveys assessing the State of Composting in the UK since 1994. They provide detailed information about the status of the composting industry, such as the amounts of organic wastes composted, the composting techniques employed and the markets into which composted products are used. The data provide important information on trends and help highlight areas for future policy development.

This survey was carried out in late 2002 to early 2003 and covered the financial year 2001/02. It comprised a 16-page postal questionnaire which was sent to all UK compost producers and a targeted sample of local authorities. An overall response rate of 59% was attained, which covered the majority of known composting site operators across the UK. An additional shorter questionnaire was sent to the community composting sector, covering the financial year 2002/03.

When compared with data collated previously by the Association, the survey indicated that the UK's composting industry continued to grow. Over the previous six years the number of centralised sites had increased by around 25% per annum, with considerable growth in the number of on-farm sites. From 1998 to 1999 the overall throughput of the industry grew by 25%; this upward trend was sustained between 1999 and 2001, doubling from 830,000 tonnes to 1.66 million tonnes per annum, through a combination of more sites and the expansion of existing sites.

During 2001 there were 132 centralised sites run by 83 operators, while there were 78 on-farm sites run by 35 operators. Centralised sites were responsible for processing over 90% of the separately collected organics in the UK. Small-to-medium sized facilities remained the focus of the industry, with the average (median) centralised site processing 8,000 tonnes per annum and the average on-farm site composting 800 tonnes per annum.

The majority of the industry operated mechanically-turned open-air windrows, which accounted for nearly 80% of the waste processed at centralised sites. Only around 10% was processed in-vessel (the remaining 10% being processed mainly in static piles with/without aerators). Between 1999 and 2001 a shift in the location of facilities occurred, with more waste being processed at dedicated (stand alone) composting facilities, as opposed to landfill sites.

Ninety percent of the waste composted centrally was processed at sites with planning permission and 82% was processed at sites with a waste management licence. Around 60% of on-farm composting took place at sites with planning permission, and in contrast to centralised sites, the majority of wastes (83%) were processed under a waste management licence exemption.

Of the 1.66 million tonnes processed, 72% (by mass) was municipal household waste, 8% municipal non-household and 20% commercial waste. The industry as a whole was dominated by green waste composting, which accounted for approximately 80% of the raw feedstocks (by mass). A further 6% was food wastes, 3% kitchen and garden wastes and 11% was a mixture of other organics including forestry, sewage sludge and paper/cardboard.

The composting industry processed 1.2 million tonnes of household waste, of which, the majority was green waste collected from civic amenity sites (86%). The remainder (14%) was collected via kerbside collections. Seventy-two percent of councils employed fortnightly wheeled bin collection services, with only 9% collecting weekly. Forty-eight percent of the councils operating kerbside schemes collected green waste only, whilst 52% collected different combinations of organics.

There was considerable geographical variation within the UK. England composted far more than any of the devolved nations, approximately 1.5 million tonnes, compared to Northern Ireland, Scotland and Wales that each composted less than 60,000 tonnes. Further analysis revealed the amount collected per household was similar in England (72 kg/household/annum) and Northern Ireland (73 kg/household/annum), both of which collected more per household than either Wales (31 kg/household/annum) or Scotland (25 kg/household/annum). Within England, approximately twice as much (average 307,000 tonnes) was processed in each of the Southern Regions (excluding Greater London) compared to Northern and Midland regions (average 136,000 tonnes).

There were approximately one million tonnes of composted products produced in the UK. The majority (68%) was used as a soil improver, which can be divided into 82% soil conditioner and 18% mulch. All other product categories combined represented only 32% of the product total. During 2001, 47% of the products were sold, 14% distributed without charge and 39% were used on the site where they were produced. These ratios were similar to those recorded in the Association's 1999 survey, except the proportion of material sold fell by 10%.

In broad terms the data showed that around a third of material went to landfill sites, slightly less than a third to agriculture and more than a third to other market sectors. In terms of compost recycled back to the land, agricultural applications represented the largest single outlet, whilst amateur gardening and landscaping were the two largest market sectors for products with potentially higher pecuniary value.

Community composting operations processed over 2,000 tonnes during 2002, with 81% comprising green wastes. The majority of wastes (72%) were composted at dedicated sites using either mechanical or hand turning. Most sites did not have planning permission, although a greater proportion of wastes were processed under a waste management licence exemption. There were 1,315 tonnes of product produced, of which, soil conditioners (900 tonnes) comprised the largest category, followed by mulches (256 tonnes) and growing media (147 tonnes). The principal outlet (64% of products) was amateur gardening.

2 Policy context

The UK composting industry has grown substantially over the past decade, principally as a result of national, UK and European policies. The Article 5 targets set in the European Landfill Directive (EC/31/1999) underpins much of this growth. To meet the targets, it has been estimated that the UK will need to divert from landfill:

- 6 million tonnes of biodegradable waste by 2010
- 10 million tonnes of biodegradable waste by 2013
- 17 million tonnes of biodegradable waste by 2020

This assumes an annual increase in waste arisings of 3% and no increase in incineration capacity (derived from the Strategy Unit, 2002).

These have been translated into recycling and composting targets, with each of the devolved nations setting themselves separate incremental targets to meet those laid down in Article 5.

The Composting Association has carried out a survey into the State of Composting in the UK since 1994. Each year the survey has become more comprehensive, driven by the demand from policy makers for a more comprehensive and detailed knowledge about the industry, and internal requirements to enable The Composting Association to promote the industry more effectively. This survey has been funded by both the Environment Agency and the Waste and Resources Action Programme, and has been fully supported by the Department for the Environment Food and Rural Affairs.

3 Methodology

The survey covered the financial year April 2001 to March 2002, and was conducted as a postal questionnaire. The questionnaire was drafted following the outline of the previous survey (1999/00) carried out by The Composting Association. This method had several advantages: it allowed the Association to build on existing knowledge, made the survey comparable with previous years and did not require extensive piloting. When designing the questionnaire comments were sought from industry representatives with experience in collating data from the waste management industry.

A 16-page postal questionnaire was distributed to all commercial compost producers and most local authorities in January 2003. The questionnaire was sent to all Authorities in Northern Ireland, Scotland and Wales. However, in England it was sent to all Waste Disposal Authorities, all Unitary Authorities, but only a targeted sample (25%) of Waste Collection Authorities.

Towards the closing date (14th February) a first e-mail reminder was sent out to all non-respondents. Feedback received indicated that there were many potential respondents that needed more time, so the deadline was further extended by one month, and a second reminder sent. Towards the deadline (14th March) the focus shifted to contacting by telephone.

The questionnaire was split into six sections:

- Section A – Contact details
- Section B – Composting site operations
- Section C – Planning and licensing
- Section D – Products, markets and end use
- Section E – Collection systems
- Section F – Other comments

Respondents were requested to complete those sections relevant to them.

The questionnaire was largely quantitative, with most questions requiring either figures or responses to categorised answers (tick boxes). There were a few open ended questions, where clarification or opinions were sought and respondents were allowed to add any general comments.

The survey was distributed to a total of 350 local authorities and 270 compost producers. It attained an overall response rate of 59%. Sixty percent of producers and 58% of local authorities responded. However, the percentage of the industry that was covered was greater than that indicated by the response rate, as many producers operated multiple sites. In terms of the proportion of organic waste composted, the survey included the majority of processors, as a large proportion of the raw material was composted by relatively few companies, which were all included in this survey.

Once returned, the data were coded and entered into the database Statistical Package for the Social Sciences (SPSS; version 11.5), which was derived from the previous year's survey. Validation checks were carried out prior to analysis in SPSS, which comprised checking the following:

- The sub-totals within sections and totals between different sections had to balance e.g. products and markets
- The outputs were in an acceptable range relative to the input
- The data were checked against 1999 returns and any significant changes were clarified
- The quantity of material processed at a mechanical and biological treatment facility (MBT) was validated against qualitative data about the process
- Producers were asked to provide the name(s) of the council(s) from which the waste was collected. Councils were asked to provide the details of the producer to which the waste was sent. Cross checks were made to avoid double counting
- The municipal waste and household waste data were compared with data collected in the devolved nations
- The municipal data collected from the producers were compared to that provided by the local authorities
- All categorised inputs were analysed to check that they were within the range specified in the questionnaire response options
- Responses from forestry sources were telephoned to make sure the bark/wood had been composted rather than matured¹
- A 20% check of the questionnaire responses against the data inputted was carried out to validate the data input
- An independent 5% check was carried out
- Any unclear or ambiguous returns were contacted by telephone for clarification
- In order to overcome the bias in the sample caused by only sending the survey to 25% of Waste Collection Authorities in England, the responses were compared to the English Municipal Waste Management Survey (DEFRA, 2001), as they were able to achieve a 95% response rate due to their intrinsic link to local authorities. The data from the Composting Association Survey and the DEFRA survey were shown to be comparable, allowing the data from this survey to be extrapolated proportionately.
- Data obtained from local authorities in Northern Ireland, Scotland and Wales were extrapolated to correlate with the specified quantities of municipal waste composted by producers in the respective countries. The UK average ratio of civic amenity sites to kerbside collections was applied to the data set.

¹ Composting involves an actively managed phase where sanitization and stabilization are achieved through controlling the process conditions e.g. moisture content, aeration. Maturation simply involves a degree of biodegradation at which the compost or bark will no longer exhibit (or exert negligible) phytotoxic effects

Some parts of the questionnaire were completed more readily than others. In order to maintain consistency in the results, it was necessary to extrapolate some categories relative to the overall total tonnage of waste composted. In particular, the market and product information was more difficult for producers to calculate and was commercially sensitive, resulting in a reduced reporting rate of the product total. For this reason, where respondents did not provide information on quantities of composted product, they were estimated by multiplying the input waste at the site (in tonnes) by a factor of 0.6 (assumed to be an approximate mass loss). Estimates of composted products (e.g. mulches, soil conditioners etc.) were derived from those respondents who did provide data, multiplied up in accordance with the overall product total.

The respondents were given a choice of unit measurement for some questions to make the questionnaire easier to complete. To convert the compost product volumes to masses, screened composts were assumed to have a bulk density of 0.6 tonnes m⁻³ and mulch/timber based products a bulk density of 0.4 tonnes m⁻³.

4 Waste collections

4.1 Municipal waste collections

The survey of collection systems was carried out to establish trends and help practitioners make informed decisions. There are two main types of collection systems employed in the UK:

- A bring scheme, which is a collection method that requires householders to take their green waste (or other recyclables) to a central point, such as a recycling centre or civic amenity site
- A kerbside scheme, which is a collection method where organic wastes (or other recyclables) are regularly collected from commercial and industrial premises and households, normally at the end of the curtilage of the property

There are three types of local authorities in the UK with regard to waste management:

- Waste Collection Authorities (WCAs) are responsible for the collection of waste directly from households (and will also collect, if requested, commercial and industrial wastes). In this survey they were therefore responsible for operating kerbside collections
- Waste Disposal Authorities (WDAs) are responsible for providing disposal sites to which it directs the Waste Collection Authorities for the disposal of their controlled wastes, and with providing civic amenity sites
- Unitary Authorities (UAs) have both the responsibilities of Waste Collection Authorities and Waste Disposal Authorities

All local authorities in Northern Ireland, Scotland and Wales are Unitaries. It is only in England where some authorities operate a two-tier system between waste collection and disposal functions. In total there were 205 local authorities that responded to the survey:

- 98 Waste Collection Authorities
- 33 Waste Disposal Authorities
- 74 Unitary Authorities

The respondents can also be divided by the type of scheme that they operated. This is shown in *Table 4.1*.

Table 4.1 The number of councils operating collection schemes

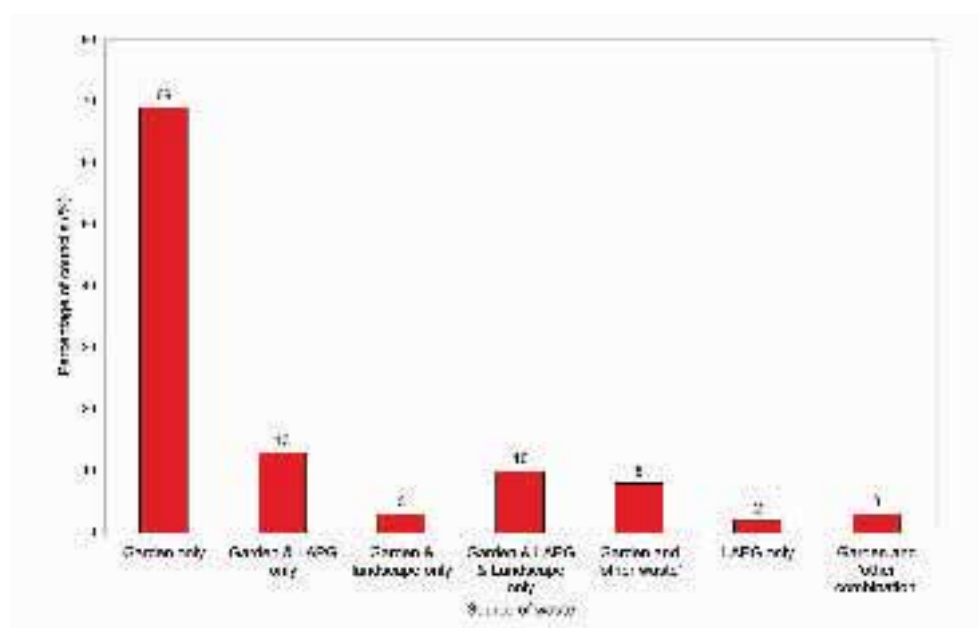
Collection scheme	Number of councils
Civic amenity sites only	89
Kerbside only	44
Civic amenity and kerbside	21
Not operating a separate collection	51
Total	205

4.1.1 Bring schemes

There were 110 councils operating civic amenity sites that responded to this survey. It was assumed that the proportion collected via bring sites or mini-recycling centres was insignificant compared to civic amenity sites and no distinction was made about the size of the population served. In essence this meant that all responses were assumed to be civic amenity sites.

The percentage of respondents that accepted different types of organic waste is shown in Figure 4.1. The main types of waste collected were ‘garden wastes’ i.e. household garden waste, local authority park and garden waste (LAPG) and ‘landscape’. The latter refers to commercial green waste accepted by local authorities. A category defined as ‘other’ was also provided and contained organics such as kitchen waste, Christmas trees, leaf sweepings and wood, but only in small quantities.

Figure 4.1 Percentage of responding councils accepting different types of organic wastes at civic amenity sites



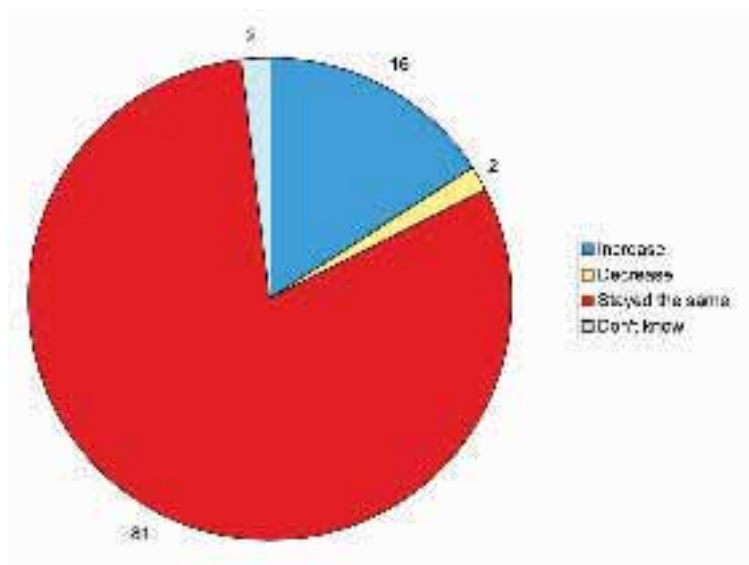
Note: LAPG abbreviation for Local Authority Park and Garden

The data showed that 69% of civic amenity sites accepted ‘household garden’ waste only and 2% accepted local authority park and garden waste only. Overall 98% of councils were accepting household garden waste, either solely or combined with other waste sources, whilst 22% accepted ‘park and garden’ waste and 13% ‘landscape’ wastes.

The size and number of civic amenity sites varied across the UK, ranging from councils that had just one site to those that operated 23. Eighty percent of councils surveyed had five or less civic amenity sites, while 50% had two or less. Therefore, most councils had a few sites probably serving large areas, with each collecting an average (median) of 2,349 tonnes of organics a year. Using the mean of 5,372 tonnes it was estimated that there were approximately 190 civic amenity sites in the UK actively collecting organic waste for composting.

The data in Figure 4.2 show that the number of civic amenity sites remained the same between 1999 and 2001 for 81% of councils and only 16% increased the number of sites in their area. This could be due to more councils turning their attention to developing kerbside collections. Although local authorities did state that 36% were planning to increase the number sites in the future (data not shown).

Figure 4.2 Change in the number of civic amenity sites operated/managed by councils from 1999 to 2001



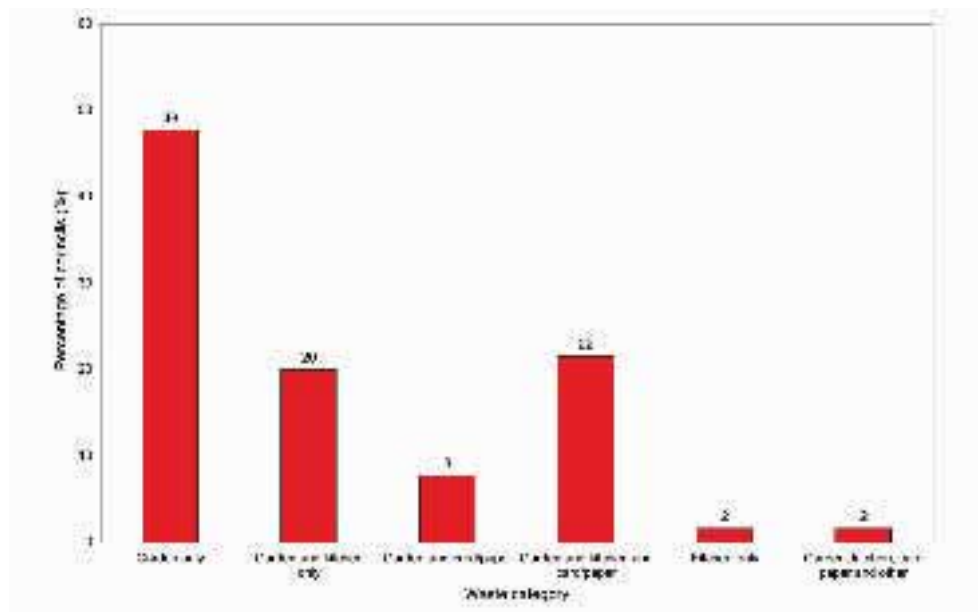
4.1.2 Kerbside schemes

The number and type of kerbside collections for recyclables has increased in recent years. Although civic amenity sites still form an integral part of the UK collection infrastructure, kerbside collections can make recycling easier for the individual, and therefore have the potential to increase diversion rates. Comparing the municipal waste fraction between 1999 and 2001, the proportion of organic wastes collected at the kerbside increased from 7.5% to 17% of the total municipal wastes composted.

The data in Figure 4.3 represents the 65 councils that operated separate collections for organic wastes; 48% accepted garden waste only and 52% operated separate collections for different combinations of organics. The majority of councils fell into one of three categories:

- Garden waste only (48%)
- Garden and kitchen/food waste (20%)
- Garden, kitchen and card/paper waste (22%)

Figure 4.3 Percentage of responding councils accepting different types of organic wastes in kerbside collections

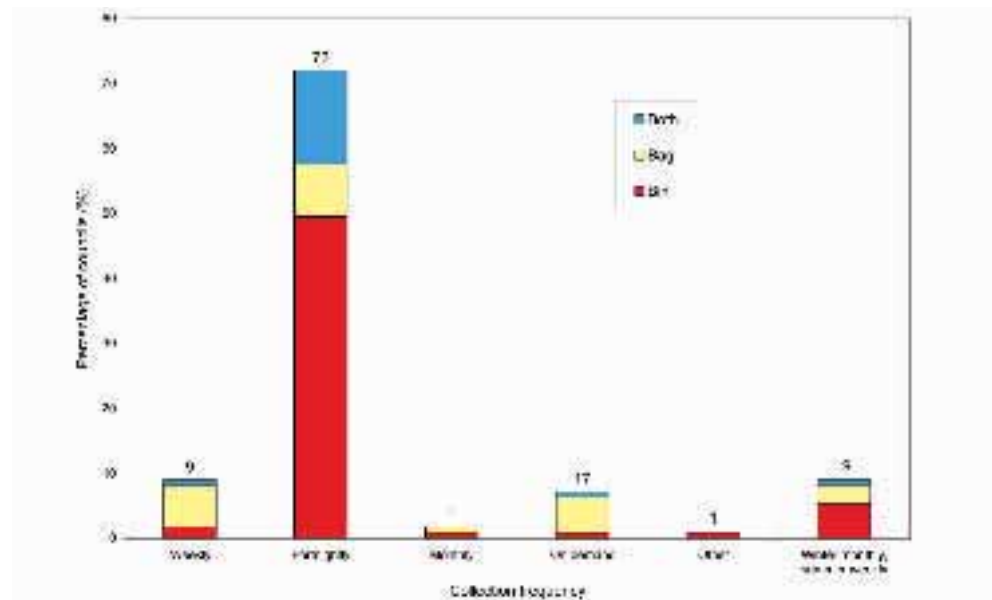


Ninety-eight percent of councils operated collections that included garden waste in their acceptance criteria. The 2% of councils that did not accept garden waste, collected kitchen wastes only. Those that accepted kitchen waste and garden waste combined represented 42% of councils (4.8% collected kitchen waste including meat, not shown in the figure).

The same data provided by producers on what they composted, revealed that they processed only 29% mixed waste. This leaves a difference of over 20% between what the producers believed were mixed waste and what the councils understood to be mixed wastes. The difference may be partly explained by the 'garden and cardboard/paper' category being included as 'garden waste' by producers, or could be due to a number of trial mixed wastes collections making the comparison between the percentage of councils collecting and the quantity of waste received at sites iniquitous.

The councils were asked how frequently they provided kerbside collections, and given the options of fortnightly, weekly, monthly, on-demand or 'other'. Many respondents in the 'other' category indicated that they collected 'weekly in the summer and monthly in the winter'; consequently, it was assigned a category of its own. Comparison with 1999 data revealed that this was a new category, not identified in other waste surveys. The 'other' category was therefore very small consisting of councils that had unusual collection frequencies e.g. two collections in eight weeks, and only represented 5% of councils. These are shown in Figure 4.4.

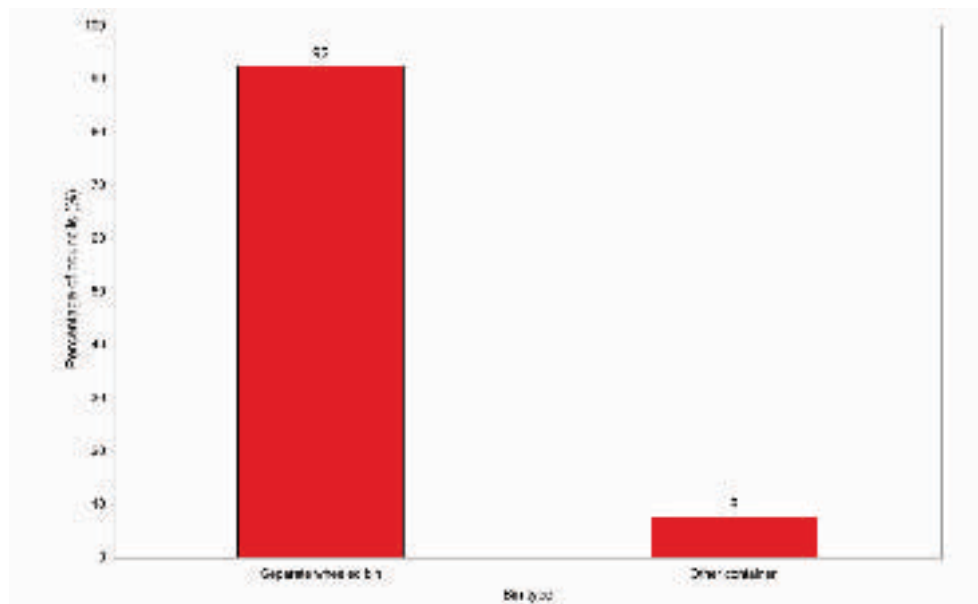
Figure 4.4 Frequency of kerbside collection and container type



During 2001, 59% of councils were collecting organic wastes using only bins, 23% were using only bags and 17% of councils using a mixture of bins and bags. The vast majority of councils (72%) collected organic waste fortnightly, 17% collected on demand and 9% of councils collected weekly, which is the same percentage as those that collected winter monthly, summer weekly (Figure 4.4).

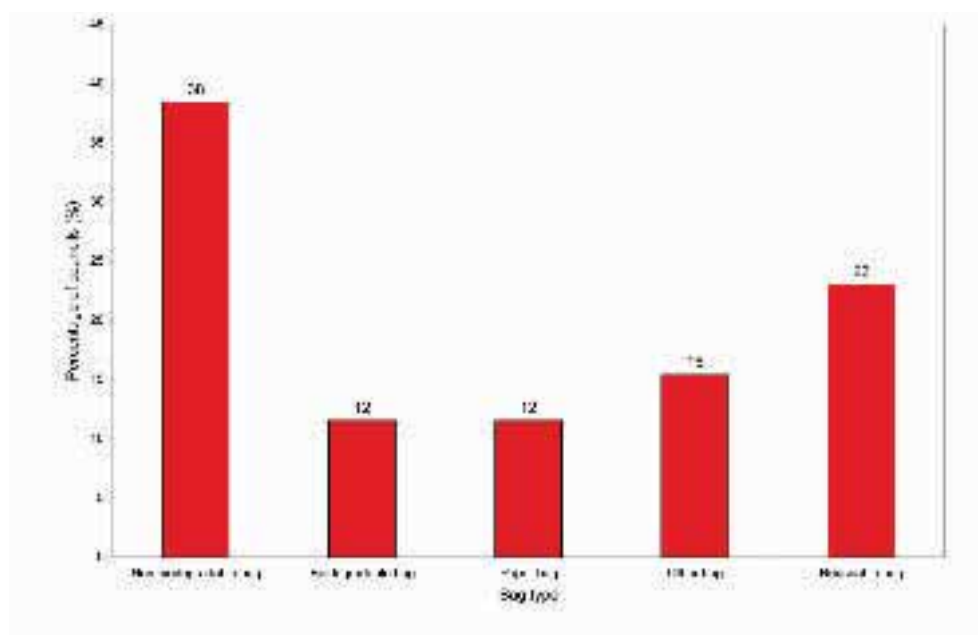
The data shown in Figure 4.5 represents the 59% of councils that collected wastes in bins. Of these 92% used wheeled bins. Further interrogation of the data (not shown diagrammatically) revealed that 85% of the kerbside collected organic wastes were collected in wheeled bins. This can be explained simply in that wheeled bins are larger and able to hold more material than other vessels.

Figure 4.5 Comparison of the percentage of councils using different bin types to collect organics



The data shown in Figure 4.6 represents the 23% of councils that used bags only. There were four different bag types that were used to collect significant proportions of material, and an ‘other’ category that represented the less significant types e.g. ‘bag supplied by resident’ or ‘a mixture of bag types’. The number of different bag types and their collection frequency was far more varied compared to bins. Non-biodegradable (mainly plastic) bags were the largest category representing nearly 38% of respondents. Biodegradable (plastic) bags were used by only 12% of councils, whilst paper bags (which are also biodegradable) were used by a further 12% of councils, bringing the overall biodegradable total to 24%. Reusable bags were used by 23% and ‘other’ bag types were used by only 15% of councils.

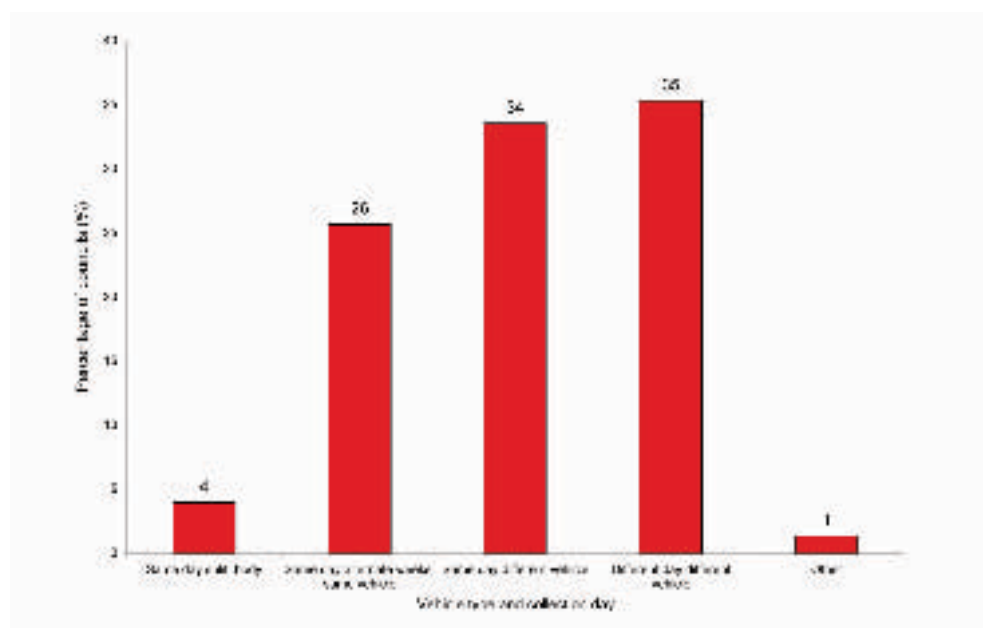
Figure 4.6 Comparison of the percentage of councils using different bag types to collect organics



Local authorities used a variety of vehicle types that operated at different collection frequencies (Figure 4.7). Thirty-five percent of respondents collected organic waste on a different day in a different vehicle to the residual waste, 34% on the same day using the same vehicle and 26% on the same day, using alternate weeks with the same vehicle as the residual waste. Only three percent of councils used a split bodied vehicle. In the ‘other’ category, councils used the same vehicle but collected on a different day or a combination of categories.

Data were collected on whether councils charged their residents (in addition to their council tax) for separate organic collections. The survey captured 15 councils that were charging residents, which represented 8,887 tonnes per annum. Extrapolating this across all the councils in the UK suggests that approximately 11,500 tonnes (7% of organics) collected during 2001 was through charged kerbside schemes.

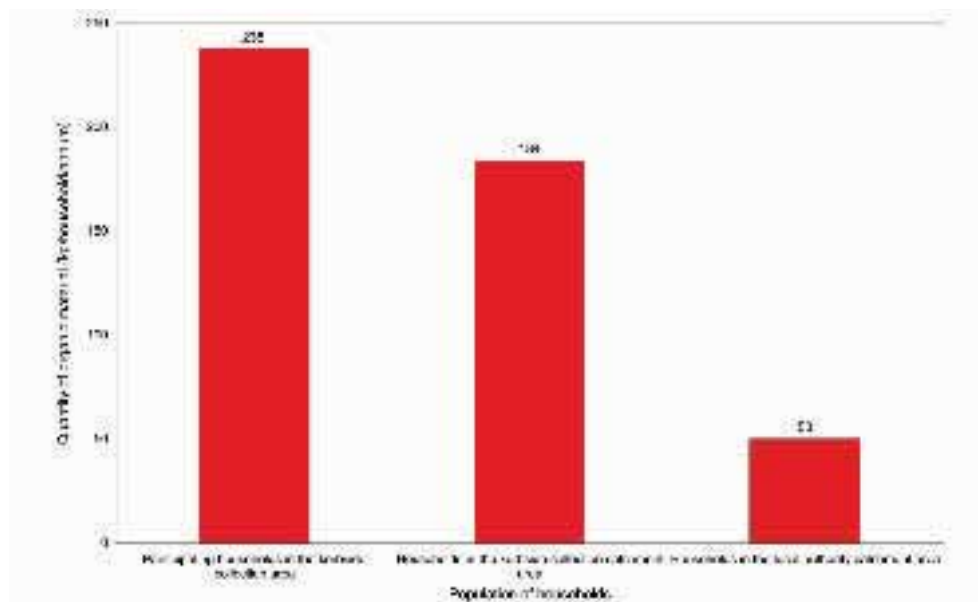
Figure 4.7 Collection vehicle types and timing of organic collection compared to residual waste



Data reporting the typical quantities of organic wastes collected per household from the kerbside are frequently requested from The Composting Association. There are several different ways of calculating this, although there are no universal or correct methods; it is dependent upon what is required from the data. Three different methods have been depicted in Figure 4.8 with very different results. It is difficult to take these statistics and apply them, due to a myriad of factors (e.g. civic amenity sites frequency) that may have significant influence at a local level.

The quantity collected per household may be calculated by dividing the total waste collected by the number of households in the council's catchment area. This does not account for the fact that kerbside collections may not take place across the entire area. A second method is to use the average collected from households only covered by the collection. However, it is still difficult to make a like-for-like comparison, as councils are likely to concentrate the collections in areas that produce large quantities of garden waste. Alternatively, only the participating households may be used. This, however, does not reveal factors, such as information campaigns that may result in far more residents participating in some areas compared to others.

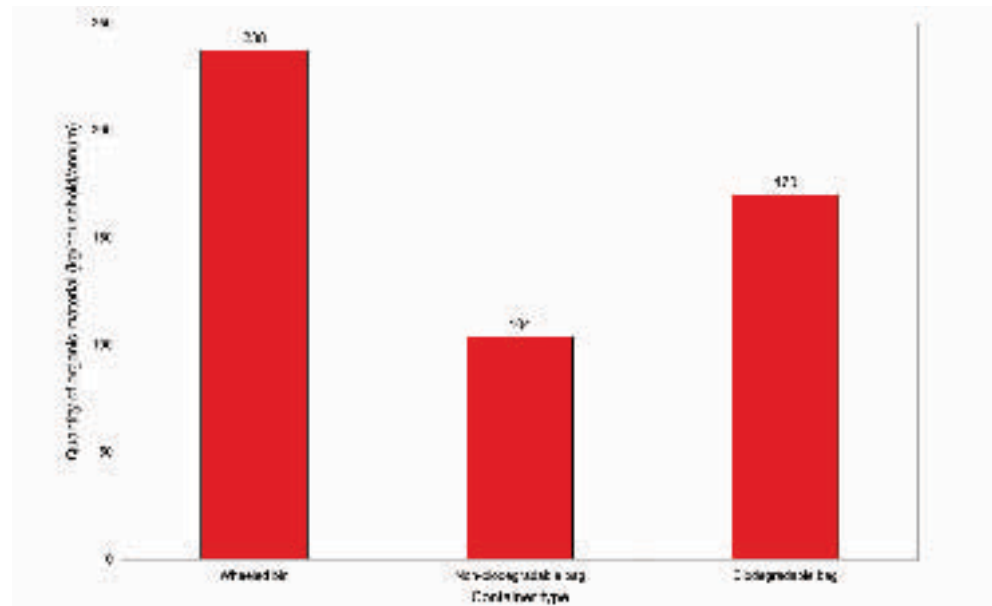
Figure 4.8 Average (mean) quantities of green waste collected in wheeled bins per household per annum depending upon calculation method used



The data in Figure 4.8 depicts the amount collected per household, and relates to 'green waste only' collected in wheeled bins. Taking an average of all responding councils then approximately 50 kg/household/annum was collected in the local authority catchment area. However, if only the area that was covered by the collection was considered, this figure rose to 184 kg/household/annum. The estimate was even greater (238 kg/household) if only the participating households were considered.

Comparisons were made between the amounts collected per 'participating household' using different container types (Figure 4.9). The figure compares the quantity of green waste collected per household in the three containers. Wheeled bins collected 238 kg/household/annum, which compared favourably to other collection methods. The data showed that biodegradable bags collected 66 kg/household/annum more than non-biodegradable bags. There was no technical reason why there should be a difference, hence it may be explained by socio-cultural factors.

Figure 4.9 The effect of container type on the quantity of organic waste collected per participating household per annum



Local authorities were asked whether the scheme they provided was mandatory or voluntary on an opt-in or opt-out basis. There were 107 respondents to this question. Mandatory and voluntary opt-out categories were combined as mandatory schemes were not enforced, so a resident on a scheme 'defined' as mandatory may not necessarily have taken part. Opt-in kerbside collections schemes collected 207 kg/household/per/annum and opt-out schemes collected 216 kg per household per annum. A t-test (assuming equal variances) between the two data sets showed that the data were not significant at the 5% level. This therefore suggested that there was no difference between opt-in or opt-out kerbside collection schemes. However, more may have been expected from the opt-in schemes, because having volunteered, householders would have been more likely to participate.

4.2 Commercial waste collections

The commercial collections section was poorly completed by the respondents. The questionnaire was primarily sent to compost producers rather than waste collectors, which could explain the poor response. In total there were just 30 responses to the question collecting 46,176 tonnes of organics (Table 4.2). Due to the poor response these data were not comparable with those presented in Chapter 5.

Table 4.2 Commercial waste collections during 2001/02

Waste source	Quantity (tonnes)
Landscape	15,697
Forestry/timber	502
Sewage	5,000
Food processing	12,385
Food retailers	480
Paper/card	1,602
Other	10,510
Total	46,176

5 Composting Facilities

This chapter reports on data that were collated from individual composting sites. Returns were received from 218 individual sites. Where compost producers operated multiple sites, questionnaires were completed for each individual site. The responses are shown in Table 5.1.

Table 5.1 Organisations operating composting sites

Organisation responding	No of sites
Waste collection authority	4
Waste disposal authority	5
Unitary	10
Producers (small/medium)	91
Waste Company	68
Agriculture	27
Equipment/trade	1
Water Company	2
Not-for-profit	1
Other	6
Forestry	3
Total	218

5.1 Classification of composting facilities

Composting facilities in the UK operated on a number of different levels, from very small-scale sites producing less than 50 tonnes of compost per annum to those that processed over 50,000 tonnes of waste per annum. The 1999 survey classified the sites into centralised, on-farm and community. This categorization was still relevant during 2001, and was repeated in this survey to enable comparison of data. However, in this survey community composters were provided with a separate questionnaire that was tailored for them; these results are reported separately in Chapter 7.

For the purposes of this survey the following definitions were used:

Centralised - sites that processed in excess of 5,000 tonnes of waste per annum. These sites normally operated under a waste management licence, received waste from external sources and either used the compost on site or distributed it externally.

On-Farm - sites that were situated on farms, tending to process less than 5,000 tonnes per year. These normally operated under a waste management licence exemption and used the compost on the farm on which it was produced.

Community – sites that processed small quantities of wastes (usually less than 500 tonnes per annum) received from the local community. They operated under a licence exemption and were managed by the not-for-profit sector.

Other - miscellaneous sites that did not fit into any of the above categories e.g. mobile contractor.

The division between on-farm and centralised sites was not always clear cut. For example a site processing over 5,000 tonnes per annum but operating under an exemption and using the compost on site was operating more like an on-farm site rather than a centralised one. Likewise sites situated on farms that were licensed or selling compost, yet only processed a small amount were also operating like on-farm sites. For this reason, sites situated on farms that met two out of three conditions listed in Table 5.2 were categorised as on-farm.

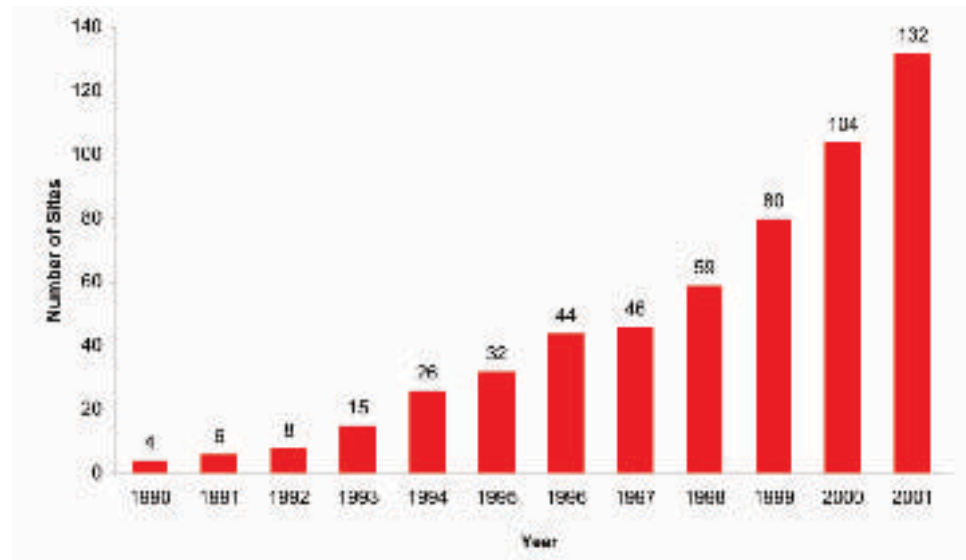
Table 5.2 Criteria used for defining on-farm and centralised sites

Ref	Criteria	Centralised	On-farm
A	Location	Not on a farm	Farm
B	Input (tonnes/annum)	>5,000	<5,000
C	Licensed	Licensed	Exempt
D	Product distribution	Sold / used on site	Used on site

5.2 Facility numbers

The responses indicated that there were a total of 218 facilities, comprising 132 centralised, 78 on-farm and eight ‘other’ sites. The data suggest that there has been a steady growth in the number of centralised facilities over the past decade (Figure 5.1) when compared with previous Association surveys. Similarly the number of on-farm sites also increased from 65 in 1999 to 78 in 2001.

Figure 5.1 Change in the number of UK centralised composting facilities since 1990



The majority (80%) of the centralised sites were operated by either dedicated compost producers or waste management companies. This is shown in Table 5.3. The acquisition of new sites by large existing waste management companies was the main area growth. There was also considerable growth in the number of new operators, particularly in the ‘producer only’ category.

Table 5.3 Changes in operator types and centralised sites between 1999 and 2001

Organisation	2001		1999	
	No of operators	No of sites	No of Operators	No of sites
Waste Collection Authority	4	4	4	4
Waste Disposal Authority	4	4	6	8
Unitary Authority	7	7	16	16
Producer only	32	38	9	11
Waste Management Company	26	67	16	28
Agriculture	2	3	4	5
Equipment	1	1	1	1
Water Company	2	2	2	2
Forestry	3	4	2	3
Other	2	2	2	2
Total	83	132	62	80

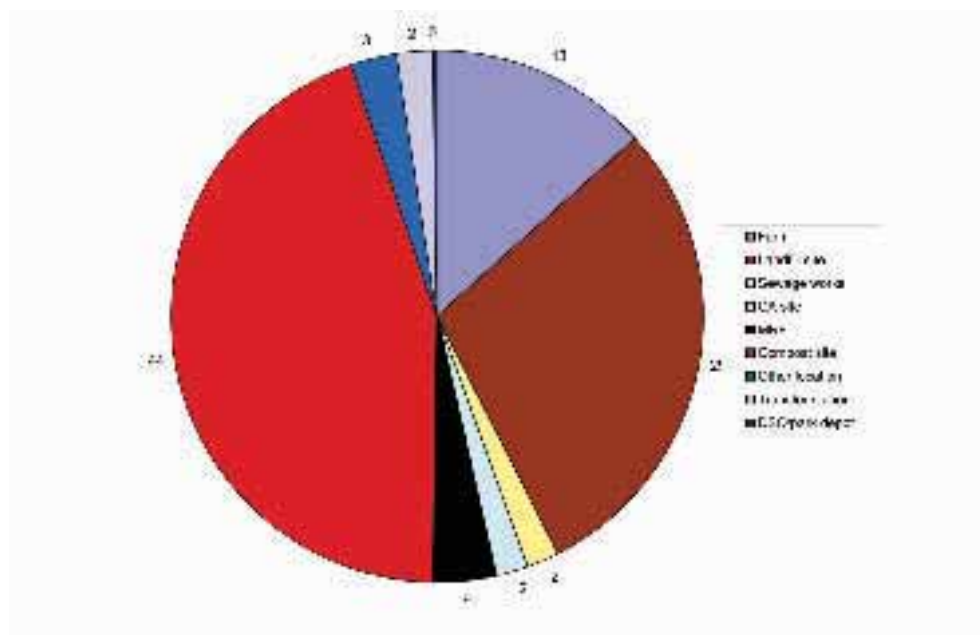
The 2001 survey classified sites into three main categories:

- 96 sites were situated on farms
- 47 were located on landfill sites, and
- 46 were dedicated composting (or stand alone) sites

There were a number of other sites situated at Materials Recovery Facilities, Civic Amenity sites and sewage treatment works, however, these made up less than 13% of the total.

Of the centralised sites only 12% were located on a farm, 35% were located on a landfill site whilst 34% were at dedicated composting facilities. This is in marked contrast to the 1999 survey, which found no centralised facilities situated on farms, 50% situated on landfill sites and 28% at dedicated composting facilities. Although there were an equal number of 'dedicated compost facilities' and landfill composting facilities in 2001, Figure 5.2 indicates that a far greater percentage of compost was processed at dedicated composting facilities.

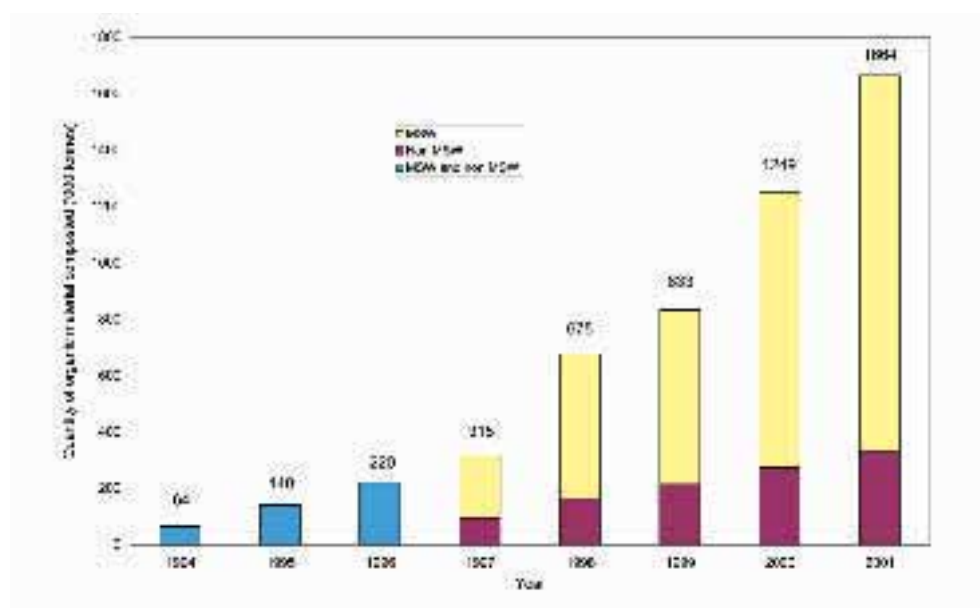
Figure 5.2 Percentage waste processed at composting facilities at different locations



5.3 Wastes composted

The UK industry has continued to grow steadily over recent years (Figure 5.3). From 1998 to 1999 the quantity recorded by The Composting Association survey rose by 23%. Since 1999 the industry has continued to expand by nearly 100%, increasing from 833,044 to 1,663,852 tonnes in just two years. Expansion is expected to continue as the previous restrictions on the composting of catering wastes and animal by-products have now being lifted, allowing a greater proportion of the biodegradable waste fraction to be tackled.

Figure 5.3 Growth in UK composting based on the total quantity of waste processed



Notes

MSW = municipal solid waste

Source (1994-1999 data) = previous Composting Association Surveys

The majority (90%) of the 1.6 million tonnes was processed in England, amounting to 1.5 million tonnes. Wales, Scotland and Northern Ireland each processed 36,920, 56,355 and 52,000 tonnes respectively. The data compared well with those collected for England (DEFRA, 2003), Wales (WAG, 2002) and Northern Ireland (DoEHNI, 2002). It was only in Scotland, where data collected by SEPA (2002) suggested that a greater proportion of municipal waste was composted. This survey identified a far greater proportion of commercial waste compared to any other nation, suggesting that there was a difference in categorisation between the two surveys.

There were significant differences between the quantities of wastes processed at the different types of site. Centralised sites dominated the industry, processing 1,523,101 tonnes in 2001 compared to 130,402 tonnes on-farm (Table 5.4). There were 54 more centralised sites than on-farm sites processing nearly 12 times more waste.

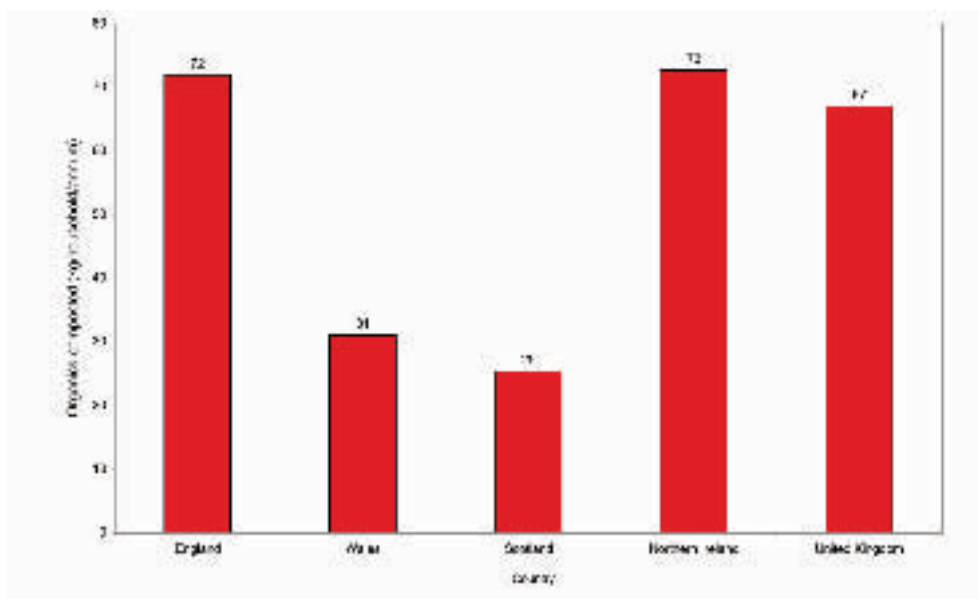
Table 5.4 Total input of organic waste in the UK by nation and site type

Country	Centralised		On-farm		Other/Site type not stated		Total	
	Input (tonnes)	Number of sites	Input (tonnes)	Number of sites	Input (tonnes)	Number of sites	Input (tonnes)	Number of sites
England	1,375,346	111	106,932	66	6,299	4	1,488,577	181
Wales	31,070	8	5,500	4	350	1	36,920	13
Scotland	39,685	9	14,970	6	1,700	2	56,355	17
Northern Ireland	47,000	3	3,000	2	2,000	1	52,000	6
Jersey	30,000	1	0	0	0	0	30,000	1
Total	1,523,101	132	130,402	78	10,349	8	1,663,852	218

The data in Table 5.4 illustrates further differences between the countries. Scotland and Wales processed a far greater proportion of their waste on-farms compared to England and Northern Ireland. England processed only 8% on-farm, Northern Ireland just 6%, while Wales and Scotland processed 18% and 38% respectively. However, it is possible that the on-farm figures were underestimates due to the difficulty in assessing many small, dispersed sites.

England composts more than any of the other UK nations, which can be explained in part by its larger population. A much fairer comparison of performance can be made by studying the amount of waste composted per household. This is shown in Figure 5.4.

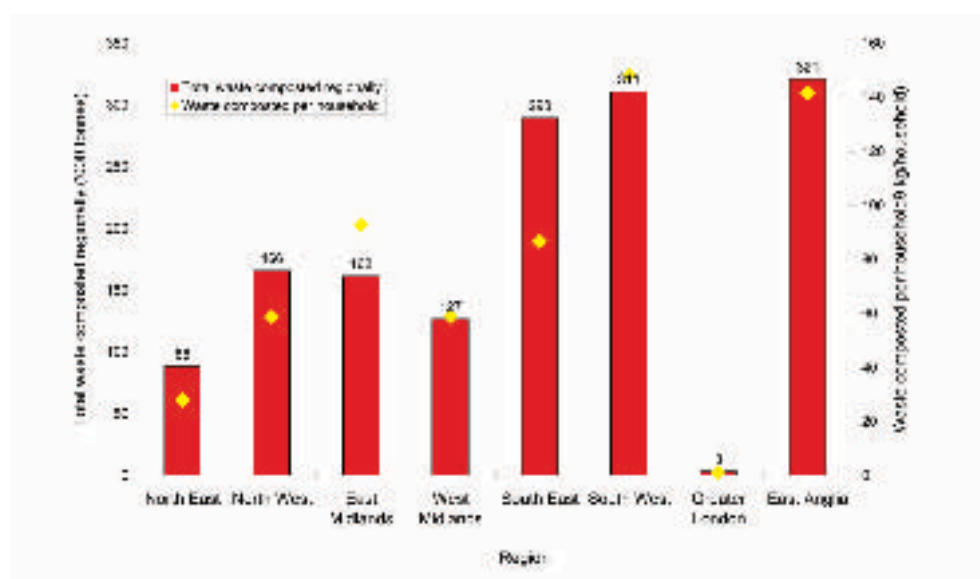
Figure 5.4 Total organic waste composted (all sources) on a per household basis



This suggests that both England and Northern Ireland composted similar quantities on a per household basis, which was over twice the amounts composted in Wales and Scotland.

Within England there was a wide variation in the quantities of waste composted on a regional basis (Figure 5.5). The data showed a clear north/south divide, with over twice as much being composted in the South East/West and East Anglia compared to Northern or Midland regions. Only a small quantity was processed per household in Greater London. Although large areas of London may not have produced much green waste, there would have been considerable quantities generated in the suburbs, which may have been transported to another region for processing. The South East region collected 61 kg per household less than the South West region.

Figure 5.5 Quantities of organic wastes composted regionally in England



The questionnaire asked respondents to provide information on the types and quantities of waste they either collected for composting or composted themselves. The responses were categorised into household, municipal (non-household) and commercial (non-municipal) as follows:

- Municipal waste was all waste that was collected by the local authorities or contractors, acting on their behalf
- Household included waste collected both from civic amenity sites and the kerbside
- Non-household waste was that collected from parks and gardens or other waste collected by local authorities e.g. food processors
- Commercial and industrial wastes included commercial landscaping and other wastes from private contractors
- Other wastes e.g. sewage sludges were included in the commercial and industrial category

The majority of waste composted was sourced from households, representing 1.2 million of the 1.66 million tonnes (Table 5.5). Household waste collected from civic amenity sites accounted for 1.03 million tonnes, approximately 62% of the total composted in the UK. The remaining household waste was predominately collected from the kerbside. A distinction was made between garden waste and mixed kitchen and garden waste. There were 115,196 tonnes of kerbside 'garden only' and 46,816 tonnes of mixed 'garden and kitchen' kerbside wastes composted. The non-household municipal fraction was 134,961 tonnes, consisting of two main components – local authority parks and gardens (approximately 29%) and food wastes (45%).

The compost operators surveyed were responsible for processing 325,356 tonnes of commercial (non municipal) and industrial waste in the UK. The majority of commercial waste, 122,512 tonnes, came from forestry sources. The second largest category was commercial landscaping, accounting for 89,798 tonnes. The remaining categories were relatively small compared to the overall total.

The commercial fraction of the waste stream was the hardest to survey, and consequently the one with the smallest margin of confidence. It is likely that significant quantities were not captured. Forestry, for example, accounted for 122,512 tonnes, however, the Office of the Deputy Prime Minister found that bark accounted for 67% of peat alternatives (ODPM, 2001), which equates to approximately 500,000 tonnes of bark. The Composting Association survey probably underestimated the true extent of commercial bark composting, although a large proportion of the difference could be accounted for in subtle differences between bark that has been 'matured' as opposed to 'composted'.

Likewise, over one million tonnes of sewage sludge was recycled to land in 2001/02 (Water UK, 2001/02). While the majority is not composted, it is likely that the 27,615 tonnes identified in this survey was an underestimation. However, the survey did not specifically target industrial sectors like the water industry.

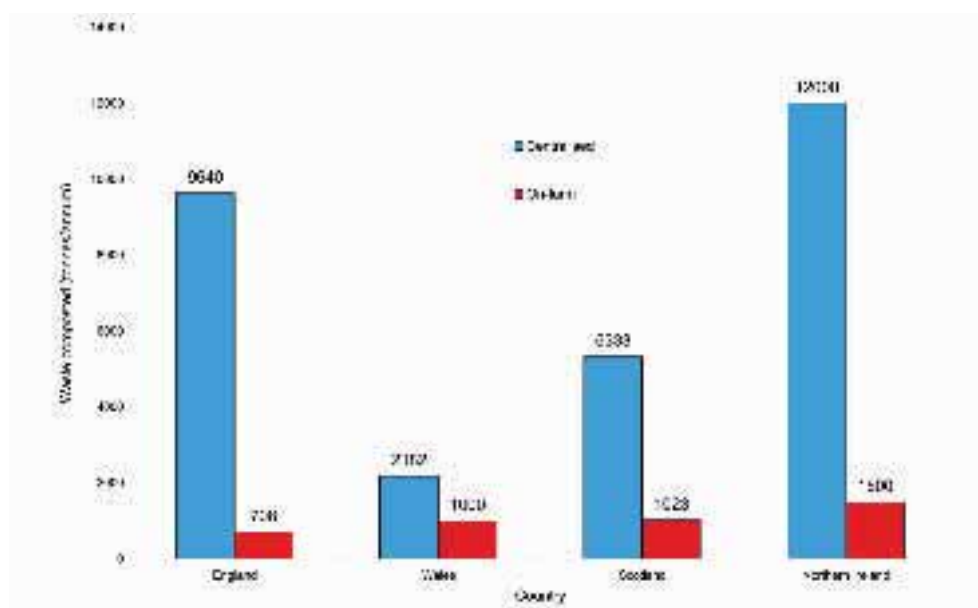
Table 5.5 Quantities and types of feedstocks composted in the UK

Waste type	Quantity (tonnes)	% of category	% of total % of total
MUNICIPAL HOUSEHOLD			
Garden from Civic Amenity / bring sites	1,037,756	86.2	62.4
Garden only from kerbside collections	115,196	9.6	6.9
Garden & kitchen from kerbside collection	46,816	3.9	2.8
Other	3,767	0.3	0.2
Total household	1,203,535	100.0	72.3
MUNICIPAL NON-HOUSEHOLD			
LA parks and garden	38,460	28.5	2.3
Other municipal landscape	12,499	9.3	0.8
Food from processors (municipal)	60,566	44.9	3.6
Food from retailers (municipal)	8,096	6.0	0.5
Other municipal	15,340	11.4	0.9
Total municipal non-household	134,961	100.0	8.1
COMMERCIAL & INDUSTRIAL			
Commercial landscape	89,798	27.6	5.4
Forestry	122,512	37.7	7.4
Sewage sludge	27,615	8.5	1.7
Food processing	32,475	10.0	2.0
Food retailers	545	0.2	0.0
Paper pulp	4,748	1.5	0.3
Paper & card	1,357	0.4	0.1
Other organic by-prod	6,716	2.1	0.4
Agricultural	39,590	12.2	2.4
Total commercial & industrial	325,356	100.0	19.6
TOTAL COMPOSTED	1,663,852		100.0

5.4 Facility size and type

The median annual throughput at centralised sites increased from 6,000 to 8,000 tonnes between 1999 and 2001, and from 635 to 811 tonnes at on-farm sites. The distribution between centralised and on-farm sites across the UK is shown in Figure 5.6.

Figure 5.6 Median throughput at composting facilities across the UK



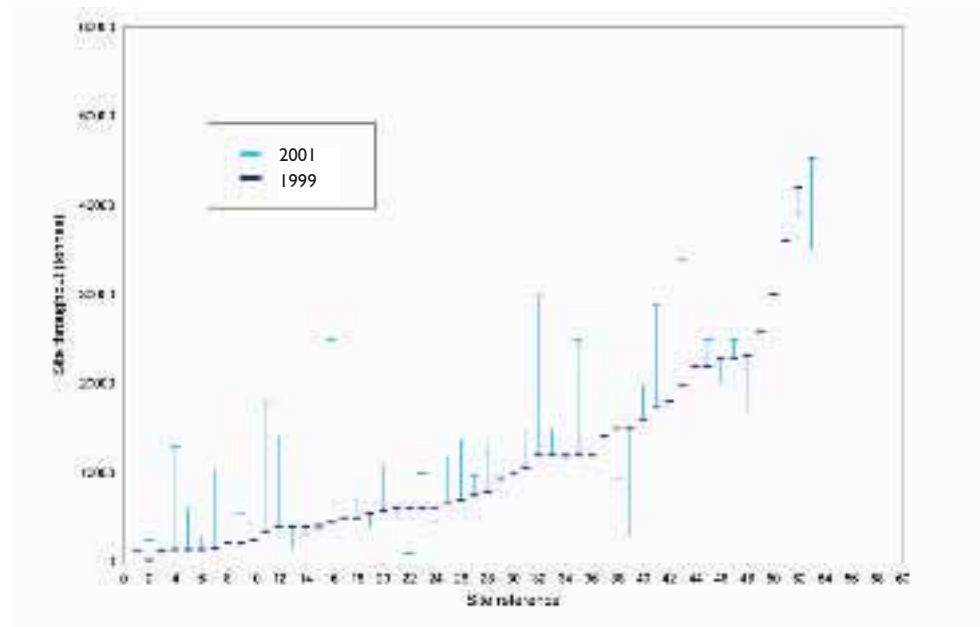
Centralised sites ranged from trials of a few hundred tonnes to sites processing over 50,000 tonnes per annum. The 25th percentile was 3,772 tonnes, whilst the 75th percentile was 15,450 tonnes per annum, showing that the industry was dominated by many small scale centralised facilities.

Northern Ireland had the largest average (median) site size at 12,000 tonnes, having proportionately fewer smaller sites. England had an average (median) site size of 9,640 tonnes (largely influencing the UK average). Wales had a very small average centralised site size – only 2,182 tonnes. In Scotland each centralised site composted an average of 5,333 tonnes.

The data showed that Wales and Scotland processed a greater proportion at on-farm sites compared to England. These data also revealed differences in the median site size: England only processed an average of 708 tonnes at on-farm sites, compared to 1,000 tonnes in Wales and 1,023 tonnes in Scotland.

Fifty-three operators replied to both the 1999 and the 2001 surveys, which enabled a comparison of site throughputs (Figure 5.7). Overall the total throughput increased from 612,614 tonnes in 1999 to 814,615 tonnes in 2001. This suggests that individual sites have increased their throughput by an average of 33%.

Figure 5.7 Comparison of throughput at sites that responded to both the 1999 and 2001 surveys



Composting facilities were categorised according to the type of process undertaken. These were classified as:

- *Mechanically turned windrows*, which were generally turned 2/3 times per week in the actively managed phase. *Continuous pile systems* (essentially one long windrow where waste was added to one end, and moved along as the process progressed) were included in the mechanically turned windrow category to be consistent with the 1999 survey
- *Static pile* processes, which did not involve turning the compost but could be either passively or actively aerated
- *In-vessel* included systems that were fully or partially contained but not indoor windrows

There were some sites that used more than one system (e.g. turned windrow, followed by a static period or in-vessel followed by a turned windrow), where this was the case the process was defined by whatever system was used during the actively managed phase.

Open air mechanically turned windrows remained the most dominant composting process at both centralised and on-farm sites. This relatively low technology method was used at 175 of the 218 sites in the UK (Table 5.6).

At centralised sites open-air windrows processed 79% of material, compared to 87% at on-farm sites. Whilst the number of open-air windrows at centralised sites had increased between 1999 and 2001 (processing an increase from 676,294 tonnes to 1,196,010), the proportion of the input processed by this method had fallen from 88% to 79%. Conversely, the percentage processed by centralised in-vessel systems had grown from 7% to 11%. In-vessel systems on farms had increased from processing only 1% of organic wastes in 1999 to 7% in 2001. Static piles with aeration represented 3% of the throughput at centralised sites, compared to none in 1999. There was also a 2% growth in the quantity of material processed in static piles without aeration at centralised sites.

Table 5.6 Comparison of 2001 and 1999 composting processes at centralised sites only

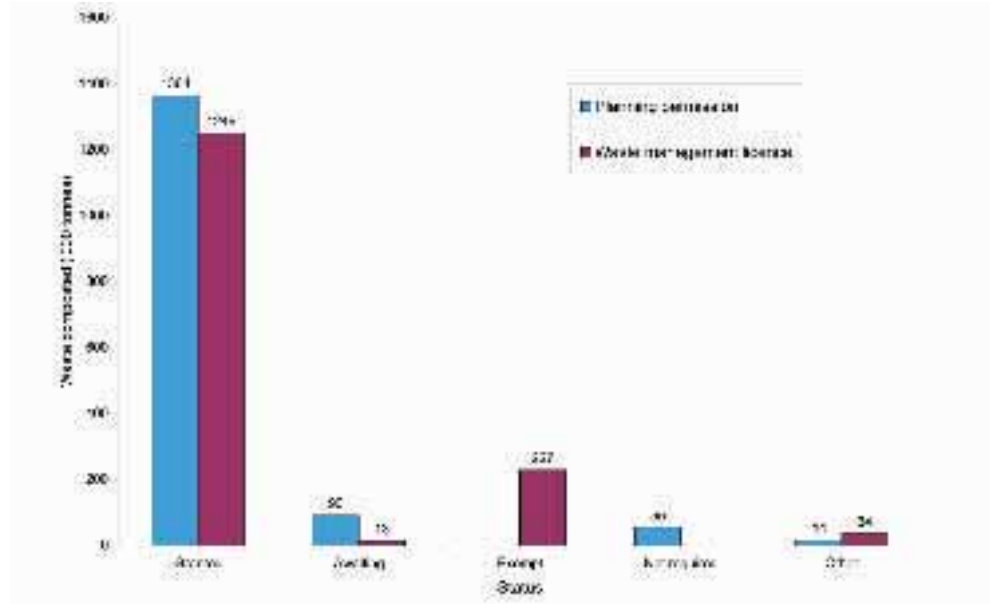
Process type	2001			1999		
	No of sites	Total input (tonnes)	Percentage of input (%)	No of sites	Total input (tonnes)	Percentage of input (%)
Open-air mechanically-turned windrow (includes continuous pile systems)	104	1,196,010	79	65	676,294	88
Contained mechanically-turned windrow	1	3,333	0	3	31,240	4
Static pile with no aeration	10	54,103	4	5	15,967	2
Static pile with aeration	3	43,325	3	0	0	0
In-vessel	12	170,078	11	5	31,765	5
Other (mixed, not known and vermicomposting)	2	56,253	4	2	9,889	2
Total	132	1,523,102	100	80	765,889	100

5.5 Planning permission and waste management licensing

Composting site operators were asked to provide information on whether they had planning permission for the site and whether they were operating under a waste management licence or an exemption. For licensed sites, the parameters their licence required them to monitor were requested. Opinions were also sought on the planning and licensing systems.

One hundred and four respondents replied on whether they had planning permission at centralised sites, whilst 100 responded on the waste management licence status. The 'other' category consisted of sites undergoing a change, and thus being in a position between categories. The data have been extrapolated to reflect the industry as a whole and are shown in Figure 5.8.

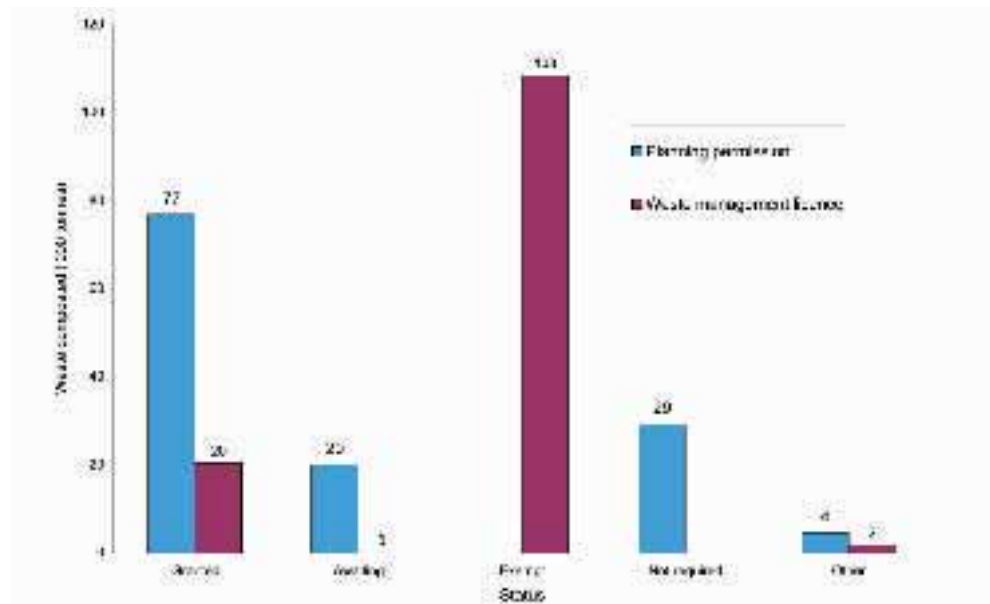
Figure 5.8 Quantity of material processed at centralised sites with planning permission and waste management licences



The data show that 90% of waste was composted at centralised sites (92) that had planning permission, whilst 82% was processed at sites operating with a waste management licence (91 sites). Fifteen percent of the centralised sites' throughput was processed under a licence exemption. A proportion (66%) may have been covered by a site licence for another operation on the same site, which accounted for the apparent discrepancy.

The planning status at on-farm sites was provided by 39 respondents, and the licensing status by 70 respondents. Again the data were extrapolated to reflect all the on-farm sites identified in the survey. The data are shown in Figure 5.9.

Figure 5.9 Quantity of material processed at on-farm sites with planning permission and waste management licences

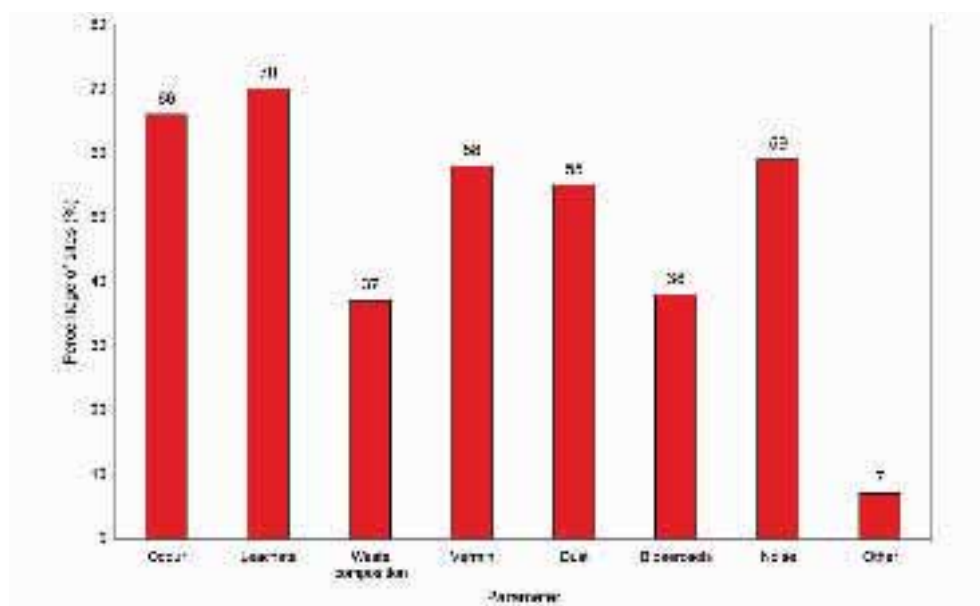


Around 60% of the on-farm sites' throughput (77,000 tonnes) was processed at sites (46) with planning permission. This proportion was far less than that for centralised sites because composting did not constitute 'a change in use of the land' for some on-farm sites.

In contrast to centralised sites, the majority of waste at on-farm sites (83%) was processed under a waste management licence exemption (66 sites). However, 15% of the throughput was processed at licensed sites. As the definition of 'on-farm composting' used in this survey included the licensed status (Table 5.2), this meant that these sites necessarily processed relatively small quantities and used the compost on-site.

Waste management licences require operators to monitor a number of processing controls and emissions from the site. Producers were asked which parameters they were required to monitor. Of the 218 sites surveyed, 71 responded to this question. The data are shown in Figure 5.10.

Figure 5.10 Parameters required to be monitored under the waste management licence



Predominantly, sites were required to monitor odour (66%) and leachate (70%). Over 50% of sites were required to monitor vermin, dust and noise. While less than 40% were required to monitor waste composition or bioaerosols. The 'other' category contained parameters such as temperature, litter, import/export of waste, surface water and meteorological conditions.

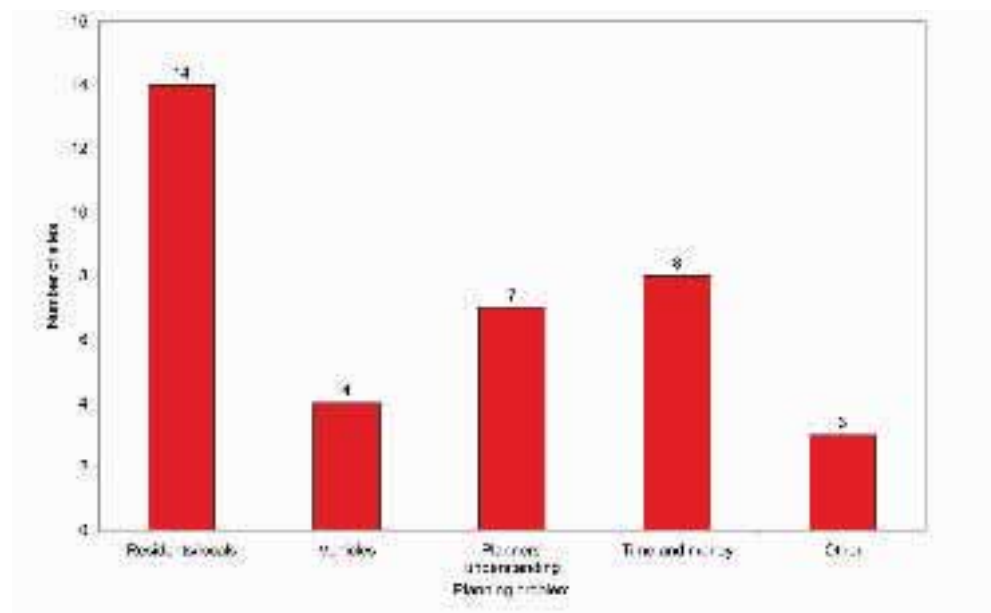
There were large differences in the number of parameters that sites were required to monitor: 16% of sites were required to monitor seven different parameters, while 9% were only required to monitor one parameter. These differences may be a reflection of the Regulator's risk assessment approach, in that sites that posed a greater risk to the environment were required to carry out more intensive monitoring.

Compost producers were asked three open questions:

- Did you have problems obtaining planning permission?
- Did you have problems obtaining a site licence?
- Have you had problems meeting the licence requirements?

There were 36 respondents to the planning permission question. This was quite high since the survey only identified 30 clear-cut new sites. There were only 20 sites that responded to the problems in obtaining licences and meeting their conditions (Figure 5.11).

Figure 5.11 Problems experienced obtaining planning permission



'Local opposition' including action groups, residents or the general community, was stated as the chief obstacle in obtaining planning permission, affecting 14 sites. There were eight sites that cited time and money, closely followed by seven sites that cited 'planners' understanding', and four sites cited vehicle movements. There was, however, some overlap between the categories: increased time and money could be a result of other problems incurred, or a problem with vehicles could be linked to the 'planners' understanding.'

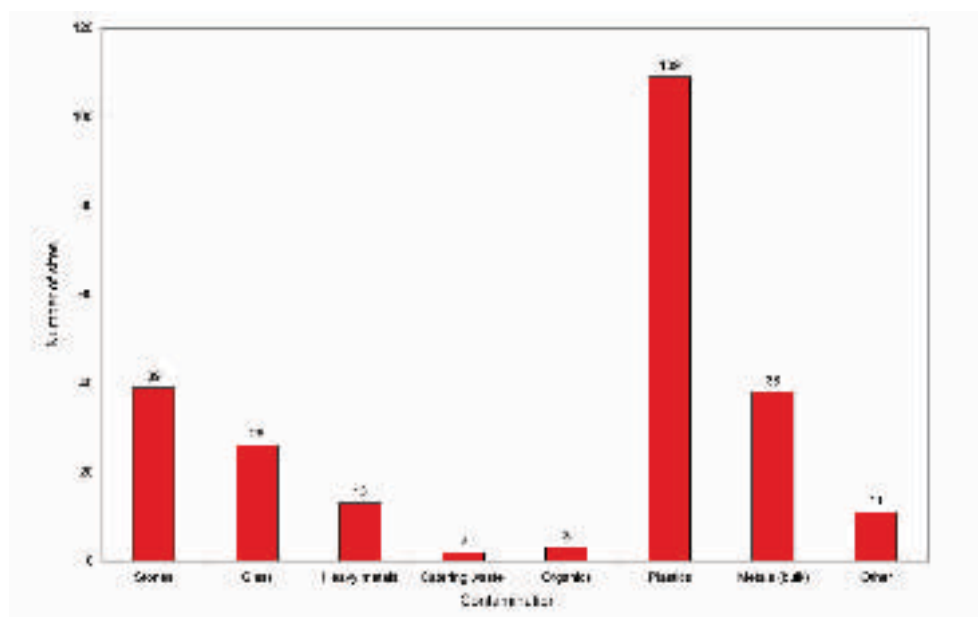
Problems with obtaining a site licence were linked predominantly to a limited number of reasons: the requirement to have planning permission before obtaining a site licence, meeting the (former) Animal By-Products Order and the requirement to monitor bioaerosols. The problems with meeting the licence requirements evolved mainly around pollution e.g. flies, leachate and odour issues. There were also difficulties meeting specific requirements, and general complaints about a lack of understanding and consistency on the part of regulators/planners.

5.6 Contamination

The respondents were asked if they had experienced problems with contaminants. There were 125 responses to the question, although no attempt was made to extrapolate the data to represent the whole industry as this may not have been representative.

Difficulties were encountered interpreting the term ‘contamination’: it may have meant that the quantity of contaminants had to be high enough to require modification of the process; the product had to be sold to a lower value market; that contaminants were present; or at the other extreme, that the load had to be rejected. Additionally, the question may be regarded as sensitive to some producers that may have been unwilling to promulgate contamination issues. The data have therefore been reported without any manipulation (Figure 5.12).

Figure 5.12 Percentage of respondents that experienced contamination in green waste collections



The respondents ranged from those that experienced no contamination to sites with six contaminants. There were seven different types of contamination identified and the ‘other’ category contained miscellaneous contaminants like paper and card, dog excrement, textiles, garden furniture etc. Of the 125 respondents, 109 stated that they had problems with contamination from plastics. This was by far the largest contamination problem experienced. Stones and bulk metals were the next largest categories with 38 and 39 sites having experienced problems, respectively. There were few respondents that had problems with heavy metals, organics or catering wastes. These types of wastes are less likely to cause a problem than materials such as plastics but are also more difficult to identify.

Producers were also asked how many loads they rejected during 2001. There were only 76 respondents to the question, of which, 49 stated that they did not reject any loads at all. At the other end of the scale some producers rejected more than 30 loads. This difference may have been due to a range of factors including the quality of material received, the standard set by the producer (and any specified in a contract), or problems associated with obtaining sensitive information.

5.7 Mechanical and biological treatment

There has been a great deal of confusion in the UK regarding mechanical and biological treatment (MBT) and the extent to which it will contribute towards local authorities' recycling targets. The government hinted that it is unlikely to be included in recycling targets (Composting Association Conference, 2002). The Welsh Assembly have stated unequivocally in 'Wise about Waste' that only source segregated organic wastes will count towards the Welsh composting targets (WAG, 2002). On the other hand, SEPA in the 'National Waste Strategy Scotland' stated that the resultant material will count towards targets once it has been 'fully recovered' e.g. in land restoration. Accordingly, landfill cover is unlikely to count towards targets under the Scottish definition, as the resulting material has essentially been consigned to a disposal operation.

The 2001 survey suggested that 84,852 tonnes of waste was processed at an MBT facility in the UK, with the majority in Scotland. It should be noted that there were problems validating the MBT data. It was difficult to identify whether the figures received represented the organic fraction or the whole mixed waste stream received at the sites. The data were, therefore, validated against qualitative data about the processes.

5.8 Future intentions

Producers were asked whether they were planning to increase the organics composted at their present site and if they were planning to open a new site. The data received showed potentially very large increases, with producers planning to increase the amount of waste composted by nearly two million tonnes over the next year (not tabulated).

This raised questions about the validity of the data. The problem was that most producers would like to increase the amount they are composting, either through new sites or increasing the throughput at the existing sites. Therefore, the data really reflected producers' aspirations, rather than a prediction of true growth. More vigorous analysis was therefore undertaken to make a prediction (Table 5.7).

Table 5.7 Composting facility operators' future intentions

Stage of plans	Percentage of sites (%)
Speculative only	17
Planning or licence applied	43
Awaiting commission	4
Other	1
Not stated	36
Total	100

Centralised sites that responded to the 1999 survey and the 2001 survey had increased their capacity by 33% over the two year period. On-farm sites also experienced an increase in capacity over the same period, and grew on average by 12%. Using these growth rates an increase in capacity of 259,136 tonnes can be expected from site-specific increases. However, it is important to note that individual site increases will reach a plateau at some point, either when they reach the site licence limit, or are operating at maximum capacity. Taking into account both new sites and site-specific predicted increases a total growth of approximately 500,000 tonnes was estimated. Although it should be noted that the growth predicted was based upon historical data and were therefore dependent upon the economic and legislative drivers present before and during 2001.

6 Products and market sectors

Returning organic matter to the soil is a fundamental argument in favour of composting. It was therefore important to establish trends in how composted products were being produced and the market sectors they were sold into. In view of that, producers were asked for detailed information about their products including, the type, quantity, particle size, standards, distribution and markets.

6.1 Product types

Composted products tended to be defined by a combination of both their intrinsic properties and their end uses. To ensure consistency compost producers were provided with definitions of compost products (these are provided in the Glossary). Compost producers provided details on the types, quantities of products and their screened fractions. They also stated whether the product met any standards.

The survey split composted products into mulches, soil conditioners, components of growing media, turf (top) dressing, ingredients in manufactured top/subsoil, and stabilised biowaste. The 'other' category consisted mainly of 'shredded green' waste that was not strictly composted, but merely shredded and then applied to the land for agricultural benefit.

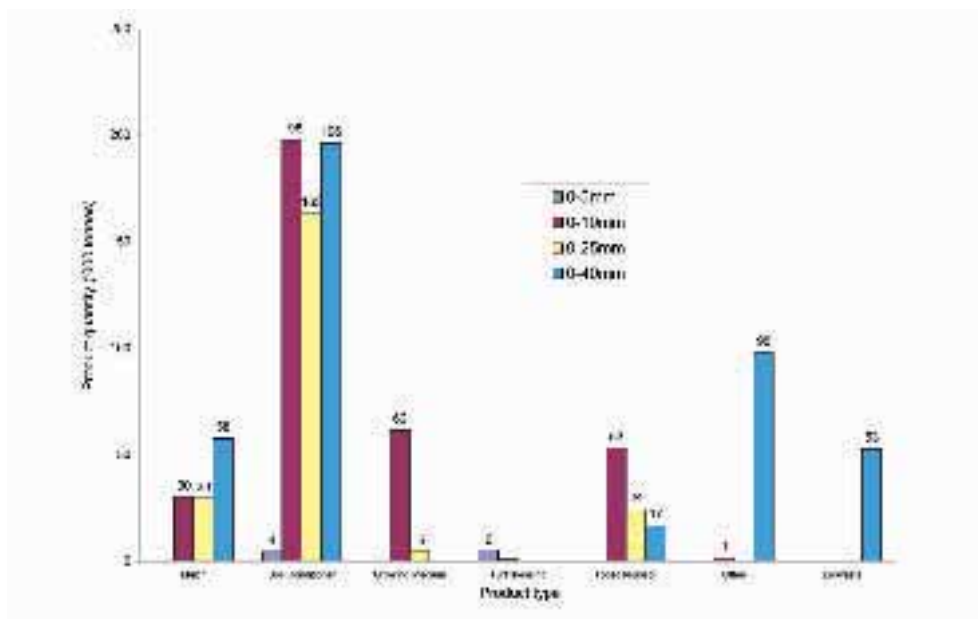
The majority of compost (680,000 tonnes) was manufactured as a soil improver (Table 6.1), which comprised 561,630 tonnes of soil conditioner (56% of products) and 117,270 tonnes mulch (12% of products). The remainder of the products totalled just less than 320,000 tonnes (32%). Turf dressings were the smallest product category totalling 6,253 tonnes (1%). The data also showed that 94,592 tonnes (9%) was manufactured as an ingredient of top/subsoil and 66,856 tonnes (7%) manufactured as a component of growing media.

Table 6.1 Quantity of composted products produced in the UK

Product	Quantity (tonnes)	Percentage of total (%)
Mulch	117,270	12
Soil conditioner	561,630	56
Components of growing medium	66,856	7
Turf dressing	6,253	1
Topsoil/subsoil	94,592	9
Other	99,319	10
Stabilised biowaste	52,802	5
Total	998,721	100

As many producers define their products according to the screen size through which they have been processed, the data have also been presented in this manner (Figure 6.1). The products produced in the UK were categorised by size into 0-5 mm, 0-10 mm, 0-25 mm and 0-40 mm fractions.

Figure 6.1 Products quantity and screened fractions in the UK 2001



Overall in the UK, 42% of compost was manufactured in the 0-40 mm category, 22% in the 0-25 mm category, 35% between 0-10 mm, with 1% 5 mm or less. There were also some clear patterns emerging for certain products. Half of the mulch products were less than 40 mm, with the 10 mm and 25 mm fractions making up roughly a quarter each. Soil conditioners were split almost equally between 0-40 mm, 0-25 mm and 0-10 mm. Growing media consisted mainly of the 0-10 mm fraction and approximately half of the top/sub soil was in the 0-10 mm fraction size. The remaining top/subsoil was split almost equally between the 0-25 mm and 0-40mm fractions.

Comparison with the report ‘Monitoring of peat alternative products for growing media and soil improvers’ indicated that 92,000 m³ of green waste was used in growing media in 2001 (OPDM, 2003). This was equivalent to about 64,000 tonnes and corresponded well with the 66,856 tonnes identified in this survey. The ODPM survey targeted growing media manufacturers, as opposed to green waste producers.

The data showed that total products more than doubled from 1999 to 2001 (Table 6.2). However, in 1999 there were 166,772 tonnes of mulch produced, which had apparently fallen to 117,270 tonnes in the 2001 survey. This could have been due to an increase in the practice of shredding, but could equally have been due to differences in reporting, for example, clearer definitions of product categories used in the 2001 survey.

The proportion of soil conditioner rose from 36% to 56%, with the amount of compost used for manufacturing topsoil increased from 2% to 9%, although the proportion used as a component in growing media fell by 2%. Notwithstanding, the total quantities used in all these product categories (except mulch) increased from 1999 levels.

Table 6.2 Comparison of 1999 and 2001 products

Product	2001		1999	
	Quantity (tonnes)	Percentage (%)	Quantity (tonnes)	Percentage (%)
Mulch	117,270	12	166,772	36
Soil conditioner	561,630	56	164,480	36
Growing medium	66,856	7	43,126	9
Turf dressing	6,253	1	n/a	0
Topsoil/subsoil	94,592	9	9,000	2
Other	99,319	10	13,258	3
Stabilised biowaste	52,802	5	66,132	n/a
Landfill cover	n/a	n/a	66,132	14
Total	998,721	100	462,768	100

The 1999 survey contained a much smaller section on products and end uses, with little information on markets. It should also be noted that a different methodology was used for both surveys, therefore a detailed comparison of the data sets was not possible.

6.2 Product distribution

Compost producers were asked what quantities of their products were used on-site, sold or distributed without charge. This is shown in Table 6.3 and Figure 6.2.

The majority of products (47%) were sold, with 14% distributed without charge and 39% used on-site. This changed from the 1999 survey, which found that 57% was sold, with 14% distributed without charge and 29% used on-site.

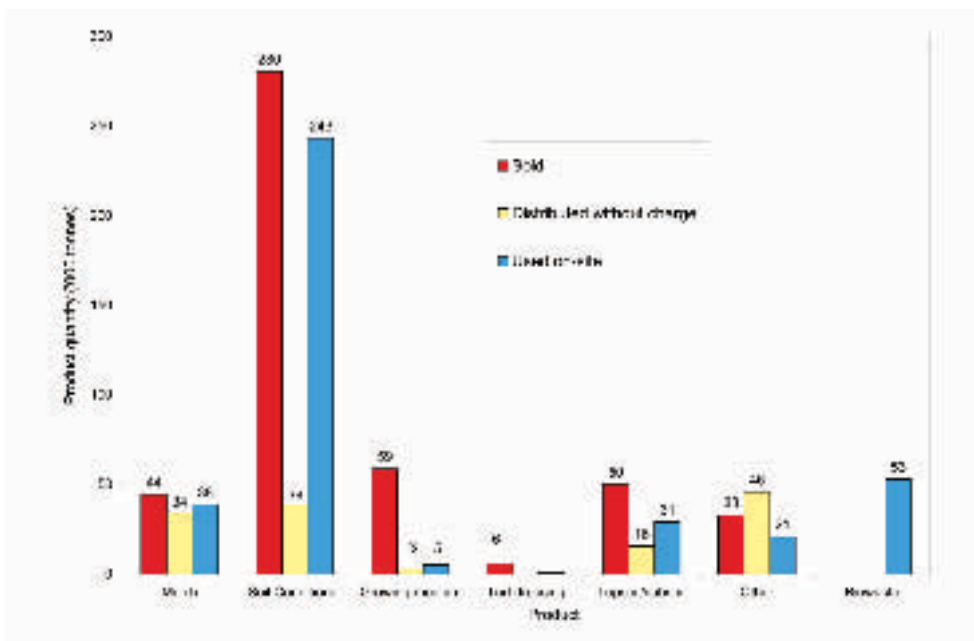
Table 6.3 Quantities of products sold, distributed without charge or used on-site

Product distribution	Quantity ('000 tonnes)	Percentage of product (%)
Sold loose	364	36
Sold bagged	108	11
Distributed without charge loose	133	13
Distributed without charge bagged	4	<1
Used on site	389	39
Total	999	100

During 2001, 47% of compost products were sold in the UK, of which 11% of the total was bagged. Slightly more compost products (52%) were not sold, being either used on-site or given away. The 39% of products used on-site, went mainly to agriculture or landfill sites. The amount of compost given away without charge equated to 14% of the product total. Of the products that were sold 77% were sold loose and 23% were sold bagged, which was exactly the same proportion to that reported in 1999.

Figure 6.2 depicts clear patterns for the distribution of products during 2001. Most products were in part either sold, used on site or distributed without charge. The exceptions were turf dressings, of which none were distributed without charge and stabilised biowastes which were all used on-site. The vast majority of growing media (88%) and turf dressings (90%) were sold. Approximately 50% of topsoil and soil conditioner products were sold but only 33% of mulches. There was also a significant quantity (34,000 tonnes; 29%) of mulches that were given away without charge during 2001.

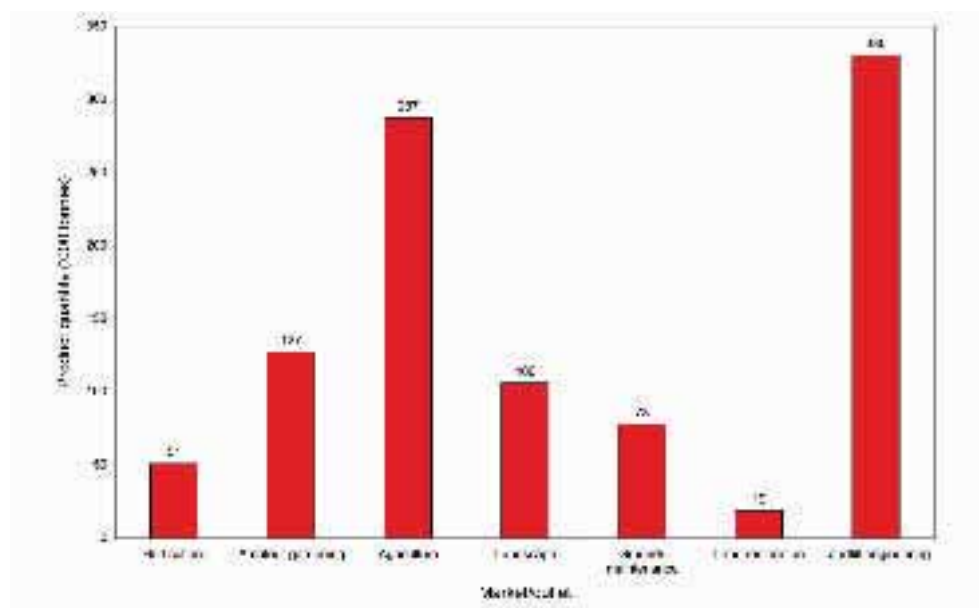
Figure 6.2 Quantities of products sold, distributed without charge or used on-site



6.3 Markets sectors

Compost producers were requested to identify the quantities that went to specific outlets during 2001. In total there were just over 998,000 tonnes of composted products distributed to different outlets in the UK (Figure 6.3).

Figure 6.3 Distribution of composted products



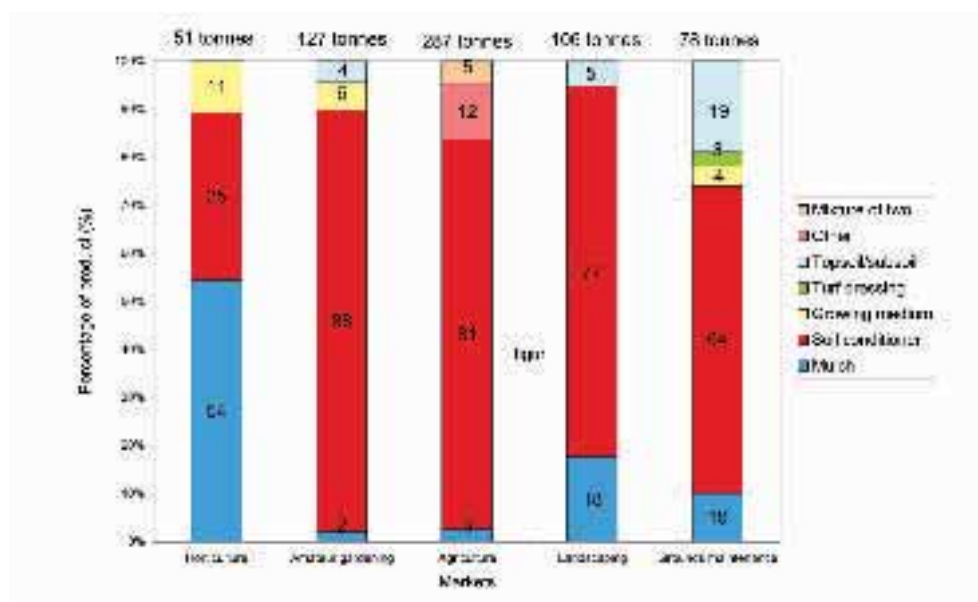
Landfill engineering/restoration combined was the largest outlet, accounting for 33% (330,000 tonnes) of compost products, of which 55% (181,000 tonnes) was used in landfill restoration. Agriculture was the largest single market segment, accounting for 29% (287,000 tonnes) of the UK total. This left 38% (381,000 tonnes) of compost products that went to grounds maintenance, horticulture, amateur gardeners, landscapers and land restoration markets. With the exception of land restoration, these markets tended to have a higher pecuniary value. Of these, amateur gardening was the largest sector manufacturing 127,000 tonnes. This was due mainly to large waste companies securing contracts with large retail outlets. Landscaping was the second largest market for saleable products, manufacturing 106,000 tonnes. It was notable (data not shown) that landscaping was often the largest market sector for medium-sized facilities or companies that specialised in producing composts only. The smallest sectors were professional growers in horticulture (51,000 tonnes) and land restoration (19,000 tonnes).

A number of other market sectors, including bioremediation, forestry and energy from waste were included in the survey. Bioremediation was incorporated into the land restoration category, since there were very few respondents that sent their compost to this outlet. No producers were aware of sending any of their products to forestry and the amount of compost sent to energy from waste was insignificant (data not shown).

The different types of composted products sold to the different market segments are shown in Figure 6.4. The data show that soil conditioners were the predominant product, representing the majority of products sold to nearly all markets except horticulture. This was consistent with the product data showing that soil conditioner represented 60% of total product manufacture.

Mulch represented 55% of the horticultural market, 19% of the landscaping market and 9% of grounds maintenance but less than 5% of agriculture and amateur gardening markets. Components for growing media were sold to 11% of the horticultural market and 5% of the amateur gardening market. Grounds maintenance utilised the greatest range of products. Ingredients for top/sub soil represented only 5% of the landscaping and amateur gardening markets.

Figure 6.4 Types of products sold in the different market segments



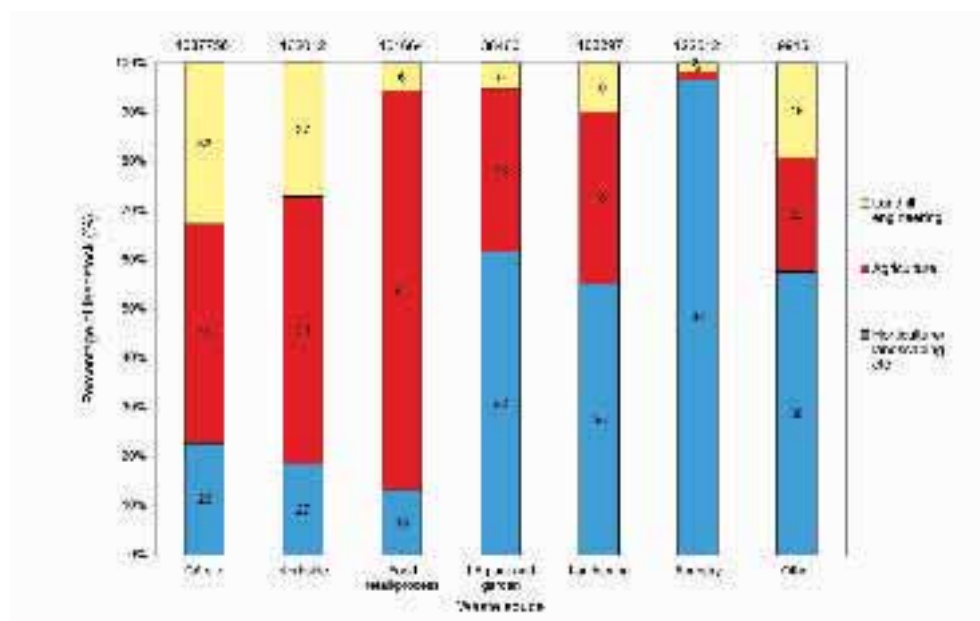
6.4 Standards for composts

Producers were asked if their compost complied with either The Composting Association’s Standard for Composts, Henry Doubleday Research Association (HDRA) Organic Standards for Landscape and Amenity Horticulture, Soil Association Standards for Organic Food and Farming or the EU Eco-label for Soil Improvers and Growing Media. The data received were not shown as validation checks revealed some ambiguities in the results. It was unclear whether producers were stating whether they were accredited, on a scheme or simply complying with in-house standards.

6.5 Destination of feedstocks

The source of the feedstock can have a direct bearing on the quality of the compost. An attempt was made to link the feedstock source with the destination of the end product. This required the aggregation of data that were in some cases disparate. The data presented are therefore approximations and not absolute values (Figure 6.5).

Figure 6.5 Feedstock and compost usage



Local authorities also provided information on the final destination of composted products derived from waste collected in their area during 2001 (Figure 6.6). There were 143 responses to the question. Fourteen percent of councils knew all of the compost collected in their area went straight to landfill uses (either restoration or daily cover). Eighteen percent knew that the compost went to both 'landfill uses' and to 'other' markets/outlets. Sixty-five percent of councils believed that some of their compost was being used in other markets including agriculture (but not landfill uses). Only 3% of councils did not know the end use of any of the compost products derived from waste collected in their area.

Figure 6.6 Destination of end products defined by councils

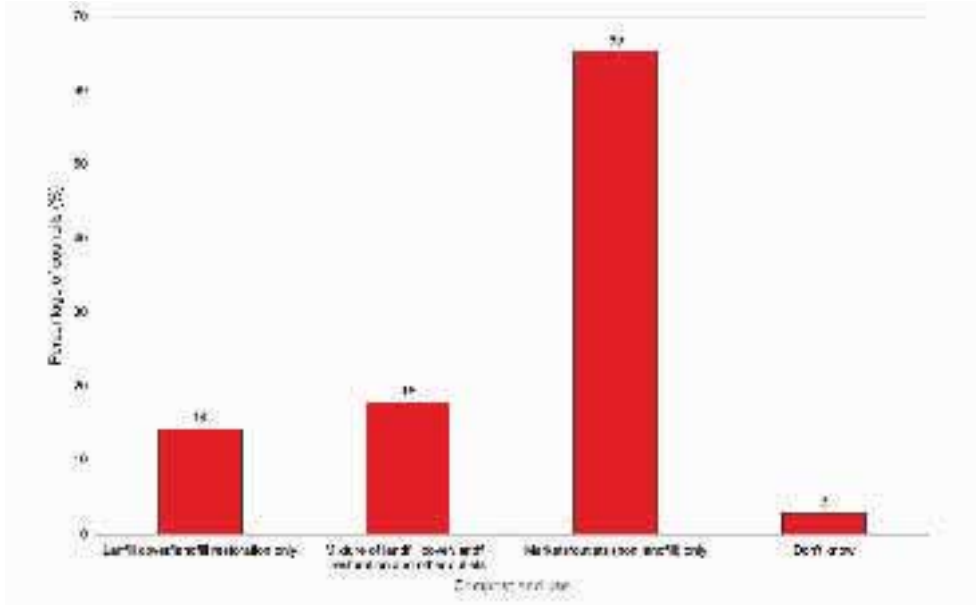
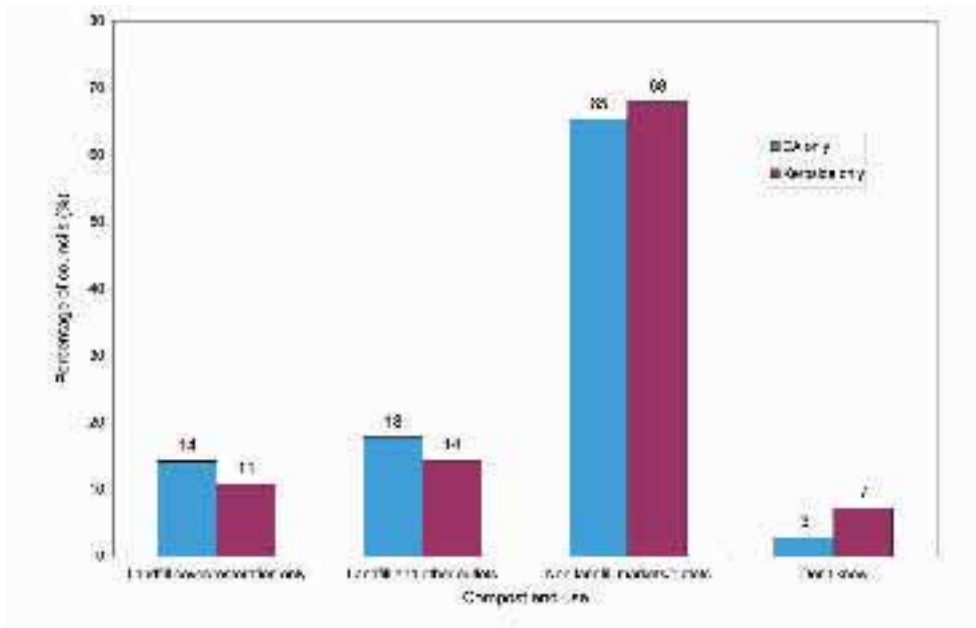


Figure 6.7 shows the destination of composts derived from councils that operated organic waste kerbside collections only (44 respondents) and councils that operated Civic Amenity sites only (28 respondents). There was less than 5% difference between 'kerbside only' and 'CA only' in all of the end use categories.

Figure 6.7 Comparison of the end use of composts derived from organics collected at bring sites and the kerbside



7 Community Composting 2002/03

A separate, shorter, postal questionnaire was sent to the community composting sector; as many of the categories contained in the principal survey were not relevant. This represented the period 2002/03 since the survey was started at a later date, and because records from 2001/02 were unlikely to have been retained.

Many community schemes measure success by the benefits they bring to the community, for example, the number of unemployed people trained, disabled people employed, or environmental awareness raised. Consequently, many schemes may not measure the quantities of waste processed or compost produced, unless required to do so for funding or credits. This meant that some quantities reported were based on visual estimates gained through day-to-day operator experience.

The community composting survey aimed to provide information on:

- Collection methods
- Site location and processing techniques
- Planning permission and waste management licensing
- Products
- Markets and end uses

A postal questionnaire was sent to 300 organisations involved in community composting projects. There were 93 respondents split as shown (Table 7.1).

Table 7.1 Community composting questionnaire respondents

Response Category	Details provided	No of sites
Community	Process details and quantities given	29
	Process details only - no quantities given	22
Total		58
Non community	Process details and quantities given	19
	Process details only - no quantities given	16
Total		35
Grand total		93

The 'community composters' were defined as operating a not-for-profit organisation or a charity, collecting and processing small quantities of waste (usually less than 500 tonnes) from the local community.

A total of 35 responses were received from organisations that did not meet the above criteria. Twenty respondents were composting (producing around 2,500 tonnes of compost), with three sites accounting for 2,000 tonnes of this. Two of the sites were agricultural businesses and the third a horticultural charity. This sector is not discussed on further in this report. Similarly, companies that composted for profit on a larger scale were incorporated into the main survey following verification steps.

The community composting survey had a 23% response rate, which was quite low. This was because many community composters were difficult to track down, as they did not employ people to answer the telephone, and in many cases only operated on a part-time basis. Furthermore, the status of schemes changed on a frequent basis (and often was not even stated). The survey, however, managed to capture all the large known community composting schemes, therefore the survey represented a far greater proportion of the sector than the response rate would suggest. Wherever quantities have been used the tonnage has been multiplied in proportion to the overall total, as there were some respondents that knew the total quantity composted but were unable to provide more detailed information for all the questions.

Whenever quantities have been used these refer to the 29 community respondents that provided these details (shown in Table 7.1), and where the data have been linked to process types it refers to the total number of community sites that responded (58).

7.1 Collection schemes

There were 44 community composters that responded to the waste collection section (Table 7.2).

Table 7.2 Waste collection method

Waste collection	Number of sites
Collected themselves	12
Collected and delivered by others	6
Produced on site only	12
Mixture of collected themselves and, By others or produced on site	14*
Total	44

*Note: For the sites that used more than one method (collected, delivered or produced the waste on-site) there were 10 that had a fraction of the waste collected and delivered by others.

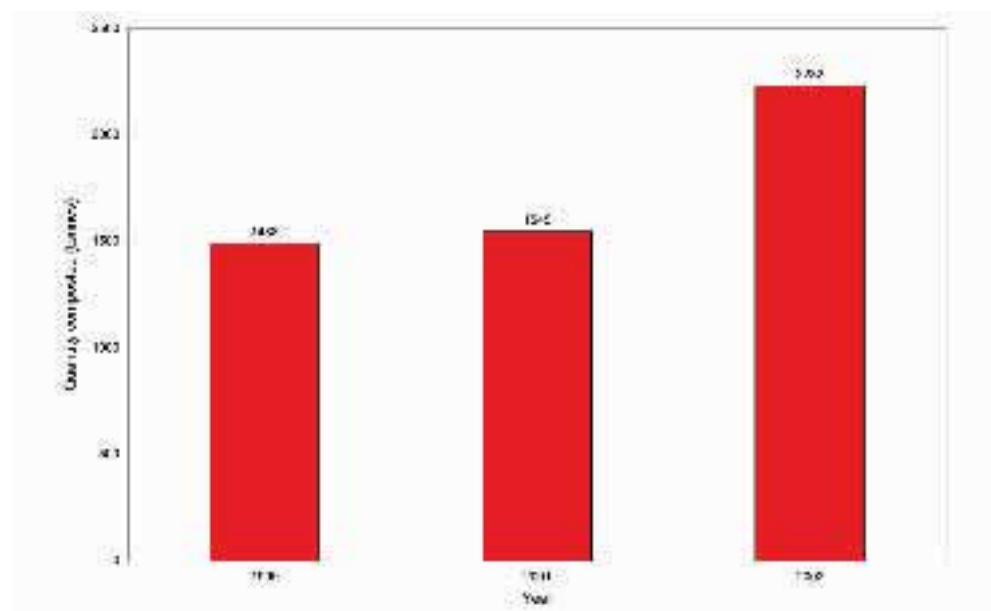
The total number of sites that had some or all of their waste collected and delivered to the sites by another organisation was 16. The waste delivery was categorised by the organisation type involved:

- 4 Voluntary group
- 5 Council
- 1 Private company
- 3 Other
- 3 Mixture of the above groups

7.2 Site location and processing methods

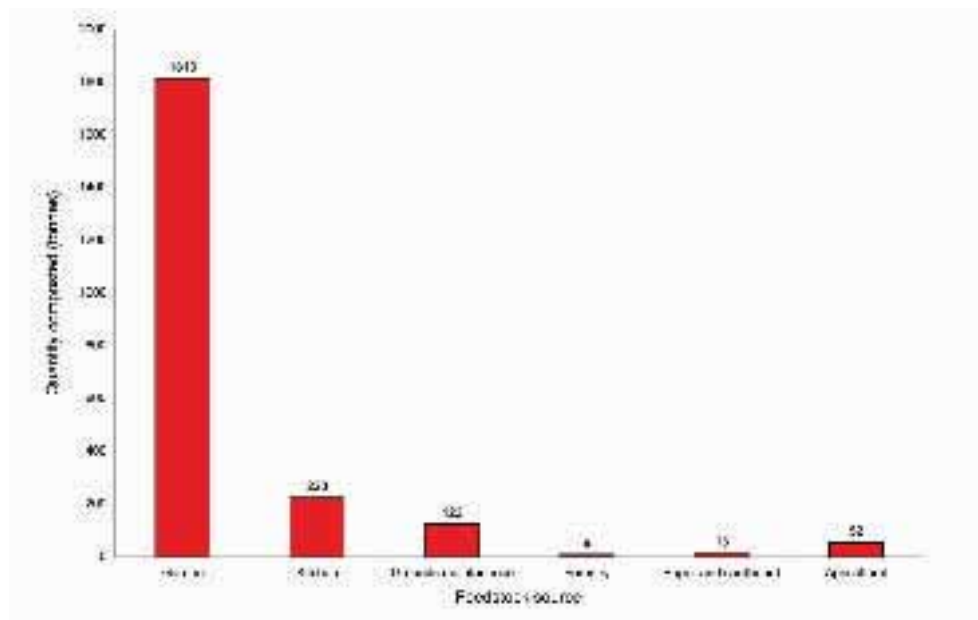
The responses indicated that community composting has grown from 1,488 to 2,232 tonnes between 1999 and 2001 (Figure 7.1). The growth that has been reported was quite small relative to the overall growth in composting. According to the Royal Society for Nature Conservation community composting groups handle an aggregated average of 1,399 tonnes each year (<http://cred.rsnc.org/>). This corresponds with the data in this survey.

Figure 7.1 Throughput at community composting sites in the UK since 1999



The different types of waste processed by community groups are depicted in Figure 7.2. Garden waste made up the majority, representing 1,813 tonnes (81%) of the 2,232 tonnes processed. The high proportion of garden waste was probably due to local gardeners being involved in many of the schemes and the fact that garden waste can be processed using simple technology compared with other wastes. Community groups processed a small quantity of kitchen waste, which was either fully contained or under-cover. Grounds maintenance, agricultural waste, paper and card were also processed in small quantities.

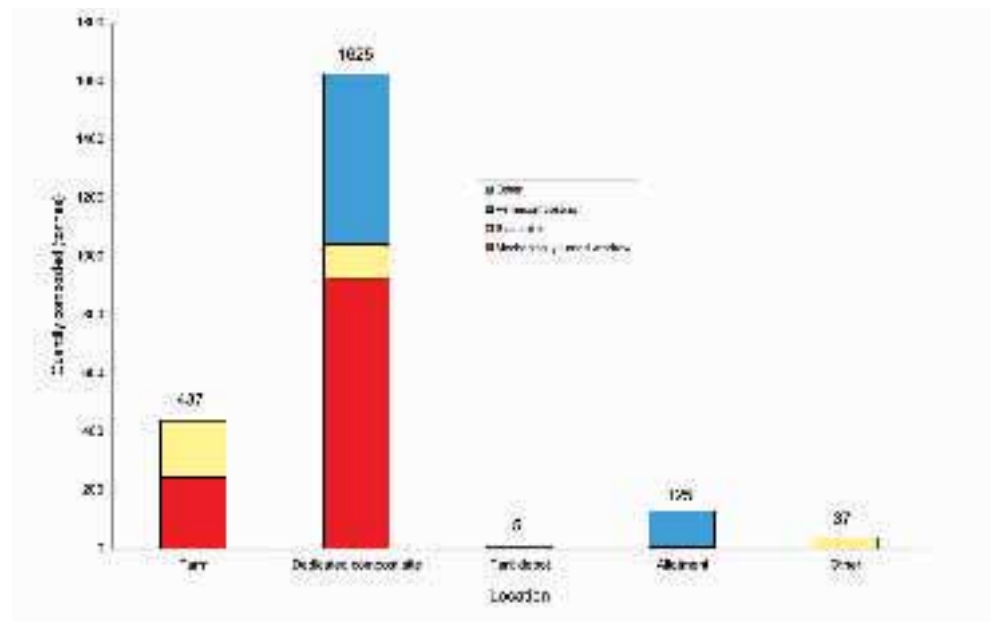
Figure 7.2 Different types of waste composted by community groups



There were very few different locations used by community composters (Figure 7.3). There were six sites situated on farms, eight sites that were dedicated solely to composting, six were allotments, two park depots and six ‘other’. The majority of waste (1,625 tonnes), was composted at dedicated composting sites. The ‘other’ category included village grounds, schools and gardens.

The data suggested that the majority of waste was processed using mechanically turned windrows (Figure 7.3). The ‘other’ category tended to be groups that turned the waste but by non-mechanical means – for example, hand-turning or using forks. The static pile composting schemes represented a much smaller quantity of organics than expected. The survey did not collect data regarding turning frequency, so it is possible that some of the data in the ‘other’ processing category could have been processed using static piles. There were several vermicomposting schemes, but these tended to process very small amounts or the producers were unable to quantify the amounts.

Figure 7.3 Location and processing systems



7.3 Planning permission and waste management licensing

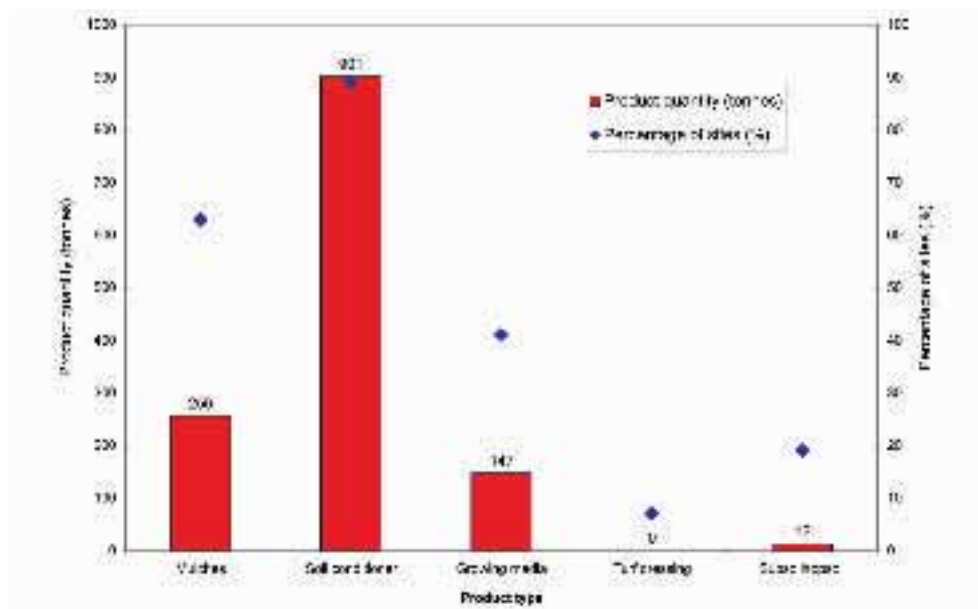
Only 28 community composters answered the question regarding whether they had planning permission. Many sites may not have required planning permission if they were operating on such a small scale that composting did not constitute ‘a change of use in the land.’ Although only a small number of sites required planning permission, collectively these composted 60% of the total.

There were 23 sites that responded to the question about exemptions to a waste management licence. Those operating without an exemption only processed a total of 10 tonnes, compared to 1,283 tonnes for sites with an exemption. Those that did not have an exemption either did not require it or were in the process of applying for it.

7.4 Products

The range of products produced at community sites were characterised by mulches, soil conditioners, growing media, turf dressings and top/subsoils. There were 19 sites that detailed the quantities of products produced and 26 that stated the types of products (Figure 7.4). The product totals have been extrapolated to represent the total waste input received by the community sector.

Figure 7.4 Composted products produced by the community sector



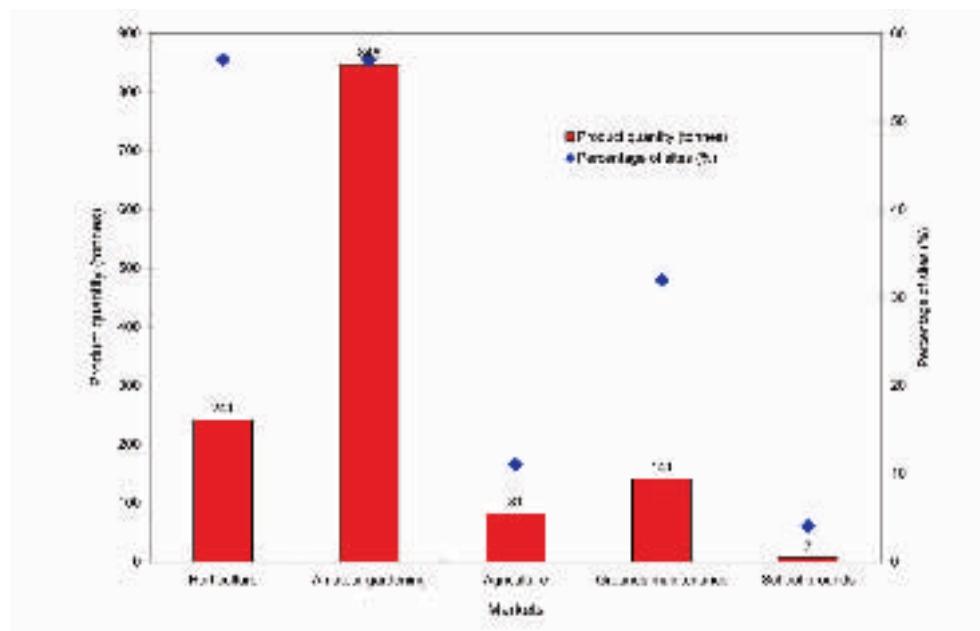
In total there were 1,315 tonnes of products produced, of which, soil conditioner (901 tonnes) was the largest category. Mulches (256 tonnes) and growing media (147 tonnes) were the only other significant products. Topsoil/subsoils were produced in very small quantities, and no producers were able to quantify the amount of turf dressing they had produced.

The vast majority of sites (89%) produced a soil conditioner, followed by a smaller number producing mulches (63%) and growing media (41%). More detailed analysis (not depicted) showed that there were a few sites producing relatively large quantities of soil conditioner, while all sites produced only small amounts of the other products.

7.5 Markets sectors

This section gives details of the markets/outlets and end uses of compost products produced by community groups. No distinction was made between products that were sold or used without charge. There were four different outlets: horticulture, amateur gardening, grounds maintenance and school grounds (Figure 7.5).

Figure 7.5 Market sectors for community composted products



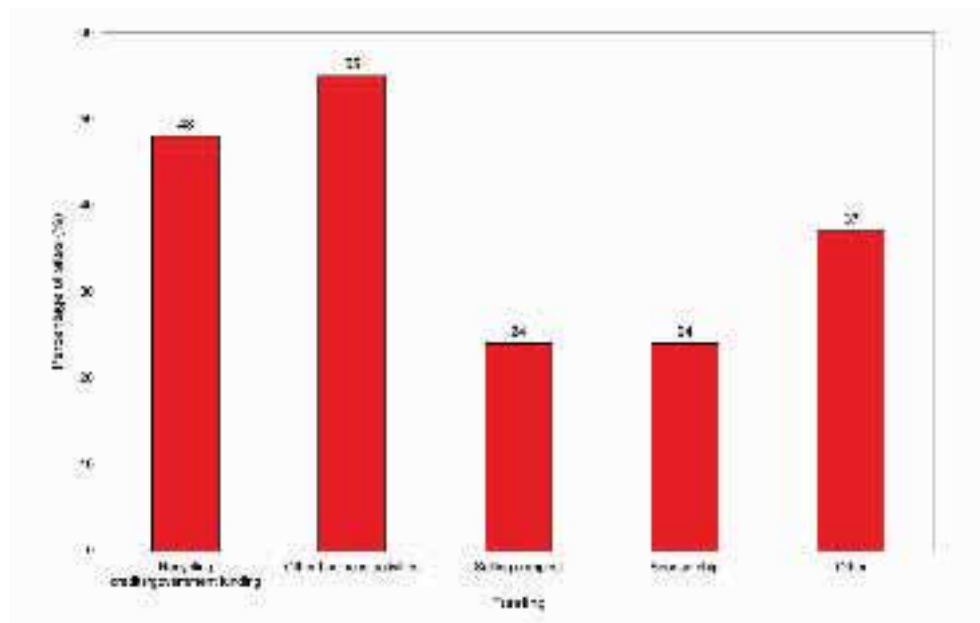
The trend for the percentage of sites sending compost to particular outlets and the quantities sent to each outlet were very similar. Amateur gardening was the largest category by far, accounting for 846 tonnes of the total 1,315 tonnes produced.

Further analysis (not shown) shows that most categories, especially horticulture were supplied in small quantities by many sites. The exception was amateur gardening, which was not only supplied by many sites producing small quantities but some of those sites produced relatively large amounts.

7.6 Funding

Community composting was a ‘low tech’ activity in 2002/03, which relied on the good will of volunteers to keep costs low. However, some sites may have had problems with economies of scale, in that the cost of producing each tonne of compost may have been quite high. The data show that many groups relied on external sources of funding. Ninety-three responses were received for this question and the data are shown in Figure 7.6.

Figure 7.6 Percentage of respondents obtaining funding from specific sources



Sources of funding fell into four main categories: recycling credits, sponsorship, selling compost and supported by other business activities within the organisation. There was also a category of 'other private funding' that composters were not required to disclose.

Approximately 50% of community composters attained funding from recycling credits and other business activities. Only 17% of composters did not attain any money from either recycling credits or business activities. Around a quarter obtained funding from sponsorship and selling the compost produced from their schemes.

8 Conclusions

The Landfill Directive (EC/31/1999) underpins much of the UK's waste management policies. The Article 5 targets necessarily mean that composting will need to play an increasingly important role in treating a significant proportion of the UK's biodegradable municipal waste that is currently landfilled. In order to meet the challenges set by the Directive a diverse and robust composting industry is needed.

During the 1990s the UK composting industry grew considerably. This survey (covering the financial year 2001/02) indicated that this growth continued into the new millennium, with a doubling in the amount of waste composted to just over 1.6 million tonnes per annum compared with the period 1999/00. The industry was, however, characterised by small-to-medium sized open-air turned-windrow facilities composting green waste collected at civic amenity sites. It was notable that only 10% of waste was processed in-vessel.

The period of the survey coincided with the implementation of the Animal By-Products (Amendment) Order (2001) as a result of the Foot-and-Mouth Disease epidemic, which effectively prevented the composting of food wastes under most circumstances. Consequently the amount of food wastes composted during this period was significantly lower than green wastes, despite estimates suggesting that it comprises around 17% (by mass) of the municipal waste stream (Strategy Unit, 2002). A significant increase in the number of in-vessel composting and anaerobic digestion systems will need to be realised in the future in order to treat municipal food wastes, coupled with more local authorities providing kerbside organics collection schemes.

The survey suggested that a greater proportion of waste was composted at dedicated composting sites as opposed to landfill sites. This suggests that composting facilities were being established as operations in their own right, rather than comprising landfill diversification activities. It was notable that Scotland and Wales relied more heavily on on-farm composting operations than England. This could reflect their rural nature, where a series of decentralised on-farm sites may better serve dispersed communities, reducing waste transportation.

More stringent environmental and health protection measures demanded by the UK's waste regulators will inevitably result in economies of scale being realised. The recently implemented Animal By-Products Regulations (2003) permits the composting and digestion of catering (food) wastes and certain low risk animal by-products, but specifies that stringent sanitisation and biosecurity measures are set in place. It is therefore probable that larger technology-dependent in-vessel facilities will need to be established to compost food wastes, whilst green wastes may continue to be composted at either centralised or smaller-scale on-farm sites. A similar trend has been noted in other European countries, such as Germany (Slater, 2002).

Many European countries that have implemented separate organic waste collection schemes also rely on mechanical biological treatment (MBT) facilities to stabilise residual biodegradable waste prior to landfill. The ambiguous returns received in this survey indicate that the terminology was poorly understood by respondents, reflecting the uncertain role this technology will play. Greater clarification on MBT is therefore required.

The survey also highlighted significant national variations, with England and Northern Ireland composting far greater quantities of organic wastes per capita than Scotland or Wales. A North-South divide was also noted in England, which may have reflected socio-economic conditions and land uses. The survey largely predated the pump-priming funds currently being administered by the devolved nations to assist local authorities implement recycling / composting schemes. It will be interesting to note whether these effect any significant changes in future years.

The markets for composted products appeared to have grown since the 1999 survey, although the two surveys were not directly comparable. The majority of products were used as soil conditioners, although a significant increase in the formation of top soils was observed, which may have been due to an increase in aggregate recycling. Agriculture and landfill engineering comprised the largest market sectors, although landscaping was the largest sector for medium-sized facilities or companies specialising in producing composts. This may reflect the changing nature of the industry, where composting is developing as a stand-alone business activity, rather than as landfill diversification.

The survey predated much of the work on market development currently being carried out by the Waste and Resources Action Programme. An increase in the quantities of composts sold to the higher value market sectors in future years is therefore anticipated.

The community composting sector represented a very small fraction (less than 0.2%) of the total amount of organic waste composted. The majority of schemes were very small, used simple mechanical or manual composting methods and operated under a licence exemption. In view of the projected millions of tonnes of organic wastes that will need to be composted to meet the Article 5 targets set in the Landfill Directive, community composting seems unlikely to play a significant role in their attainment. However, as organic waste kerbside collection schemes will need to be increased, the educational value of community-run schemes seems likely to become increasingly important in educating householders about composting.

9 Glossary

Amateur gardeners

These are hobby gardeners that buy compost through retail outlets, civic amenity sites (or make their own).

Biodegradable materials

These are materials capable of undergoing biologically mediated (either aerobic or anaerobic) decomposition to form water and carbon dioxide.

Bioremediation

The biological treatment of land to remove, stabilise or isolate soil-polluting substrates.

Bring collection scheme

A collection method that requires householders to take their waste (or other recyclables) to a central point such as a recycling centre or civic amenity site.

Centralised site

A large composting site which (for the purpose of this report) processed in excess of 5,000 tonnes per annum. These sites were normally licensed, received waste from external sources and either used the compost on-site or distributed it externally.

Community composting

Composting organizations that process very small quantities received from the local community, usually less than 500 tonnes per annum, operating as either a charity, not-for-profit or campaign organisation.

Commercial waste

Waste arising from premises used wholly or mainly for trade business, sport, recreation or entertainment, excluding municipal and industrial wastes.

Compost

The solid particle material that has been aerobically processed to form a sanitized and stabilized product that is high in humic substances, and that confers beneficial effects when added to soil and/or used in conjunction with plants.

Composting

The process of controlled biological decomposition of biodegradable materials, under managed conditions that are predominantly aerobic and allow the development of thermophilic temperatures as a result of biologically produced heat, in order to achieve compost that is sanitary and stable.

Daily cover

Materials that are spread over landfilled waste on a daily basis to prevent pest/odours and dilute toxicity.

Exempt composting site

A composting sites that is registered with (but not licensed by) the regulator and does not require a site licence under The Waste Management Licensing Regulations 1994. In order to comply with the exemption criteria these sites must use the compost on-site and the total quantity on-site at any time must not exceed 1,000 m³.

Grade

A term used to describe a range of compost particle sizes, which usually result from screening the product. The particle size can be described in units of screen aperture size (usually in mm) or as 'fine', 'medium', or 'coarse'.

Green waste

Organic waste such as grass clippings, tree cuttings, leaves, which arise from gardens, parks or landscaping activities.

Grounds maintenance

The up-keep of 'green spaces' (mainly local authority), which includes those associated with highways.

Growing media

These are materials (other than soils) used alone or in specific mixtures to grow plants in containers.

Horticulture

The term describes an industry of professional growers that use intensive systems to grow flowers, nursery stock or fruit and vegetables.

Household waste

Waste originating from the household that is collected at the kerbside, civic amenity sites or other bring sites. It includes litter, bulky and hazardous household substances.

Ingredient in manufactured top/subsoil

Compost or other material mixed with poor quality soils or other material (e.g. sand or construction and demolition fines) to produce topsoil prior to landscaping applications.

Kerbside collection scheme

A collection method where organic wastes (or other recyclables) are regularly collected from households, commercial and industrial premises, normally at the end of curtilage of the property.

Land restoration

The process of improving the quality of land, or augmenting inadequate soil e.g. brownfield sites or mining areas.

Landscaping

The development or construction of soft landscapes (mainly private sector), including those associated with highways.

Licensed site

A composting site that is licensed under The Waste Management Licensing Regulations 1994. It must be operated within the terms and conditions that are stated by the regulator in the site licence.

Mechanical and Biological Treatment (MBT)

A process that involves the biological treatment of mixed wastes, either aerobically or anaerobically. The biological process is usually preceded by mechanical separation, but this may be carried out after biological treatment.

Mulch

Large particles (usually timber/wood products) applied to the surface, to suppress weeds, retain moisture, prevent soil erosion or for decorative purposes.

Municipal waste

In the UK, this includes household waste plus any other wastes collected by a Waste Collection Authority, or its agents, which includes municipal parks and gardens waste, beach cleansing waste and any commercial and industrial waste for which the collection authority takes responsibility.

Non-household waste

Wastes that are collected from parks and gardens or other wastes collected by local authorities, that did not arise from households.

On-farm sites

Composting sites that were situated on farms, tending to process less than 5,000 tonnes of wastes per year, that were normally exempt from a waste management licence and use the compost on-site.

Open-air turned-windrow

A composting technology that involves arranging the biodegradable waste into long, low rows ('windrows') that are usually 'turned' periodically to aerate waste as it degrades.

Producer

A business enterprise, organization, community initiative or person(s) that is responsible for the production of compost.

Screening

A stage during the composting process that involves sorting compost particles according to their size in order to achieve one or more separate grades.

Soil improver

Material added to soil *in-situ* primarily to maintain or improve its physical properties, and which may improve its chemical and/or biological properties or activity.
Sub categories: soil conditioner, mulch.

Stabilised biowaste

Material resulting from mixed (unsorted) waste composting that does not have much oxidisable carbon and therefore low microbial activity, which is characterised by low oxygen uptake rates, and low carbon dioxide and heat evolution rates.

Turf (top) dressing

Compost that has been screened to a fine grade then used to improve the establishment and growth of turf.

Unitary Authority

A local authority charged with the duties of both Waste Collection and Waste Disposal Authorities.

Waste

Any substance or object which the holder discards or intends to or is required to discard.

Waste Collection Authority (WCA)

A local authority charged with the collection of waste from households in its area on a regular basis. It can also collect, if requested, commercial and industrial wastes.

Waste Disposal Authority (WDA)

A local authority charged with providing disposal sites to which it directs the Waste Collection Authorities for disposal of their controlled wastes, and the providing civic amenity sites facilities.

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Notes

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