



EM-1 Product Review 2007

Project Name: Cobra EM1 – 1 / Green Waste Control

Department: Shelford Composting Ltd

Focus Area: Application on Shredded Green Waste and its effect on Odour and Final Product

Product/Process: Green Waste Composting, Open Windrow, Pass 100 & QP Certificated

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1 Back Ground, Shelford Composting Ltd

Shelford Composting Ltd is located on the northern slope of the Stour Valley with a surface elevation of approximately 30mAOD (metres above ordnance datum). The surface topography of the surrounding area ranges between 10mAOD and 50mAOD, with a southerly dip towards the River Great Stour.

To the north and north-east of Shelford Composting, lie Barton, Little Hall and Beecham Woods which form part of the West Blean and Thornham Woods Site of Special Scientific Interest (SSSI) complex. Beyond Beecham Wood to the north and east of the site lies Maydon Cottages, the village of Broad Oak and Shalloak Road.

Residential properties along Broad Oak Road, the Cathedral Trust Workshop and the offices of Provian Construction Ltd are located to the south-east of the site. The Canterbury to Ramsgate railway line, Broad Oak Road and the River Great Stour run in a south-west to east-north-east direction to the south of the site. Beyond the River Great Stour lies a caravan park, the Maybrook Industrial Estate, Sturry Sewage Works and an Electricity Sub-Station.

To the south-west of the site lies agricultural land, beyond which lies the residential suburb of Hales Place. To the west and north-west lies agricultural land with intervening woodland, beyond which lies Alcroft Grange, Cheval Place, The Cottage and Eastingdown residential properties. To the East of the Site lies Broad Oak Village.

Operations at the Site comprise receipt of green waste for processing by aerobic composting. After initial receipt of the waste, processes at the Site will include sorting, shredding, composting using a system of windrows and screening. Composted product will be graded and stored prior to its removal from site.

The type of waste that will be accepted at the facility for treatment will be organic waste capable of being composted. The feedstock will principally be green wastes arising from civic amenity sites, kerbside collection schemes, local authority parks/grounds and highways maintenance and landscape contractors

2 PROJECT EM-1 OUTLINE

To trail a new product to combat the potential odour generated from the composting process. Cobra Hydro Ltd are marketing EM -1 as a completely organic product to combat odour generated from the composting process, increase composting process and improve quality of end product from a nutrient value.

The product EM-1® is made of a mixture culture of naturally-occurring micro-organisms from 3 main genera: phototrophic bacteria, lactic acid bacteria and yeast. In composting we use Effective Micro-organisms to reduce odour and flies and to improve compost quality. Also the compost process can be speeded up by 50% in the windrows and a reduction of methane, sulphur dioxide, hydrogen sulphur and ammonia is an added bonus making this product environmental friendly.

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The effective micro-organisms secrete beneficial substances such as vitamins, organic acids, chelated minerals and antioxidants when in contact with organic matter. EM-1® can be used to recycle all types of organic waste including food waste. AWBP approved by DEFRA and PAS 100 registered for green waste composting.

The trial will commence on the 1st May 2007 and was granted approval by the Environment Agency

During the trial period all green waste will be treated at the shredding stage with the EM-1 product. The shredded material will then be formed in to windrows and processed in line with the standard operating procedures under Pass 100.

The green waste shredder will be modified / configured with a dosing pump, which will dose the shredded green waste as it drops of the end conveyor.

There will be a magic eye on the dosing equipment to ensure that dosing of product stops if shedding stops.



The EM-1 will be delivered in a ready to use liquid . An application rate of 1litres per tonne will be applied to each tonne as the green waste is shredded and passed over the conveyor. The loading rate of the solution may vary, pending the waste mix which will be reviewed during the course of the trial.

The solution will be supplied in IBC containers for easy use. Additional re-circulated water may be added to the windrows if the material is to dry. A representative from the Cobra Hydro will be on site during the initial phase to ensure that the dozing rate and application rate has been correctly set up.

The shredded material will then be formed into a windrow and a batch number used to identify the row. This windrow will be monitored / processed as per our normal operating procedures.

In addition the site team will carry out an odour audit during the course of the shredding trial and record the findings. If any malodours are detected during this phase the works will be suspended.

If it becomes apparent during the sanitisation / stabilisation that the windrow is failing then the steps outlined in the odour management plan will be followed and if required the affected windrow will be sent to landfill as waste. We will notify the Agency prior to any removal of waste.

2.1 Project Details

The trial will commence on the 1st May 2007 and run until the end of August 2007. All green waste inputs during this stage will be subjected to EM-1. Under the Pass 100 process the site normally achieves product conformity at a minimum of 10 weeks with graded material at 14 weeks.

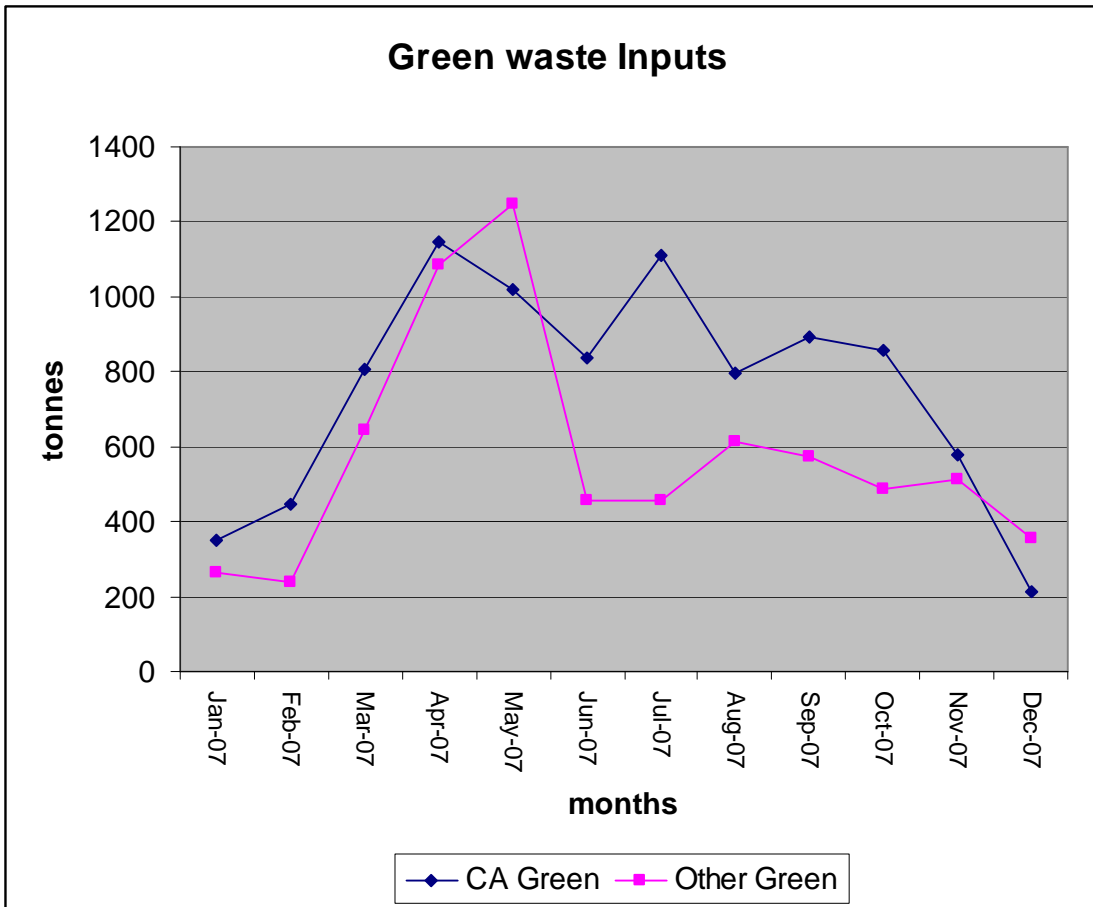
By running the trial over this period all windrows being processed, maximum of 10 windrows stored would have been treated with the product. This would provide a comparison of final product against untreated windrows being processed and subjective analysis on any odour issues identified.

Odour complaints received based on previous years results for the same time period in 2007 will be reviewed. This is subjective and though minor differences in the composition of the feed stock will take place it is assumed that the general blend remains constant. This is based on the customer base not changing in 2006 and 2007.

A review of the 2006 sample analysis and 2007 sample analysis of the final grade compost will also be undertaken to see if any changes have been noted. This will have a limited capacity as the trial primary undertaken to evaluate EM-1 as a odour control product.

Monthly rainfall will also be recorded on site.

Shelford Composting Total Green Waste Inputs by Month Direct CA Delivery and Kerb Side collection (Other Green)



The above graph shows the total tonnes of Green Waste from Civic Amenity Sites and Kerbside collected green delivered into Shelford Composting Ltd by Month.

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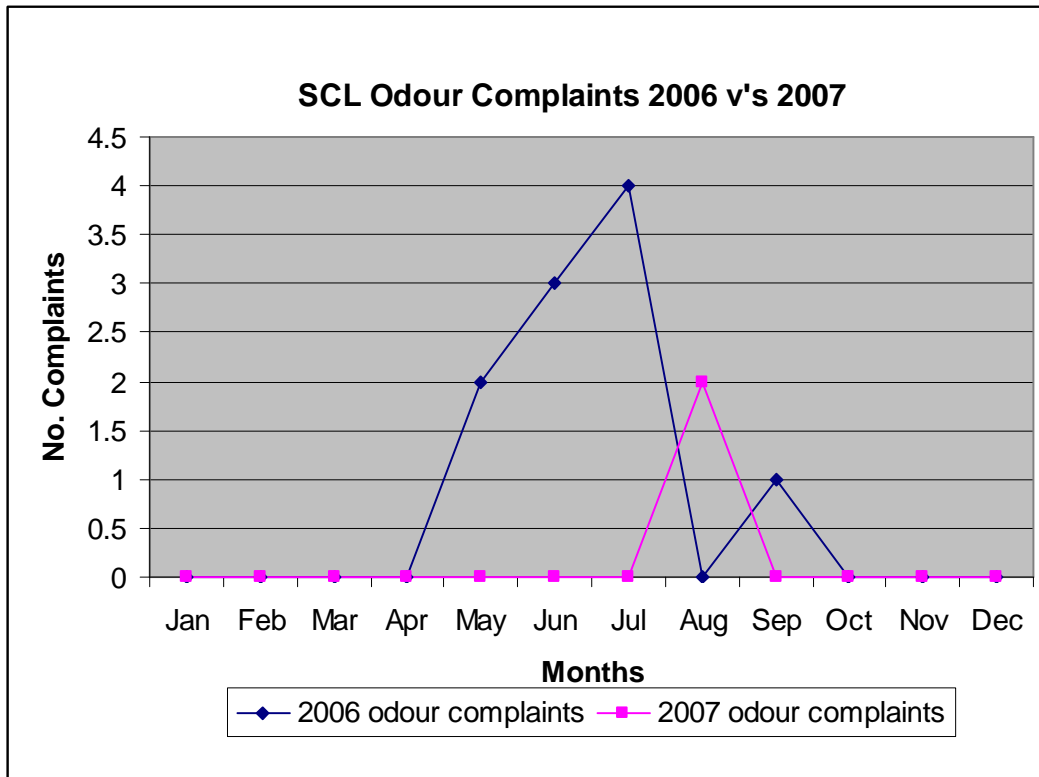


The above graph shows the comparison of total green waste inputs by month for 2006 and 2007. Though the annual total varies the “odour “ periods, normally associated with the site are from April to September. This coincides with the increase in kerb side collection of green waste from the district authorities. The kerbside collection is based on a fortnightly collection of green waste in a 110 ltr eurocart. The kerbside green waste has the potential to be malodorous / anaerobic when it arrives on site.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2006 totals	129	452	1,002	2,448	2,032	1,876	1,438	1,485	129	2,054	46	639	13,731
2007 totals	616	687	1,455	2,233	2,266	1,296	1,569	1,411	1,468	1,345	1,094	566	16,006

You will note that though an increase in the overall tonnage is noted for 2007 only a small variance in the monthly inputs of April to August exist.

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The above graph shows the number of odour complaints registered in the site log for 2006 and 2007. A total of 10 odour complaints were recorded in 2006 and only 2 odour complaints in 2007.

It must be noted that 2007 also had an exceptional high rain fall. Table below shows the rainfall in mm recorded on site using a Weatherlink 5.6 monitoring station.

A breakdown was recorded in July 2007 whereby the product was not able to be applied for 2 weeks. This coincides with the odour complaint in Jul 2007.

Rainfall in mm	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2007	41.1	49.8	40.1	0.5	75.4	82.5	134.6	50.3	24.1	39.4	32.8	32.5

2.2 EM-1 Dozing Program.

The product was dosed 1ltr per ton.

3 Compost Grades Analysis Results 2006 / 2007

VM to supply data set for review.



4 Recommendations

VM to discuss with Cobra .

Prepared by _____

Project Manager

Approved by _____

Project Sponsor



1 APPENDICES

1.1 Document Guidelines

1.2 Project Status Report Sections Omitted
