(A REVIEW OF)

THE AVAILABILITY OF NEW ZEALAND COMPOST FACILITIES TO PROCESS COMPOSTABLE COFFEE CUPS AND FOOD PACKAGING

5)

COMMERCIALLY COMPOSTABLE

> PREPARED BY BEYOND THE BIN FUNDED BY THE PACKAGING FORUM'S PUBLIC PLACE RECYCLING SCHEME PUBLISHED JUNE 2017

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executive summary

From January to April 2017 Beyond the Bin conducted a research survey of 27 composting facilities throughout New Zealand (that were identified as relevant) to be surveyed about their experiences with processing compostable food packaging including compostable coffee cups.

The results of the research indicate that the NZ composting industry can be generalised as currently or previously experimenting with processing compostable food packaging waste with a multitude of differing levels of success.

The largely differing outcomes are based on:

- Variation in types of compostable food packaging processed
- Variation in processes and methodology across different composting facilities

All surveyed facilities had experienced some challenges with processing compostable food packaging and had either adopted new processes or implemented restrictions to solve the issues or had simply stopped processing this type of waste.

Amongst the issues that were raised included barriers such as confusion with oil-based polyethylene (PE) coated cups and other conventional plastics, length of processing time, the need for these items to be shredded finely and issues with some particular brands or product types not breaking down. In some cases the facility's length of processing time meant they could process some types of compostable food packaging such as unlined cardboard, but not types of compostable plastic such as Polylactic Acid (PLA).

Composters face significant difficulty to identify compostable food packaging as such and noted the lack of a NZ compostability standard for food packaging to meet to apply such an identification. This concern extends to noting that food packaging requires different lengths of processing depending on its composition, so one standard for all compostable packaging could create issues for composters. However, this report recommends the packaging industry working with other industry bodies to develop an identification standard for compostable food packaging such as coffee cups.

Other major and common issues for NZ composters are:

- contamination of the waste stream
- lack of education across compostable waste producers of what can be composted
- a number of items in the marketplace which are mislabelled as compostable or biodegradable which are not.

NB. Survey participants were asked if they would like to be named as processing "this type of waste" being compostable packaging and the food it contained. Eleven facilities answered yes to this question. All other information provided by composting facilities was to be considered confidential but is aggregated in this report to provide an understanding of the composting industry with relevance to processing "this type of waste." This allows for a district-level picture of the 11 "yes" facilities, districts with potential future opportunities, and districts with no expected future opportunities for processing this type of waste.

background & introduction

objectives

The Packaging Forum estimates that in New Zealand 295 million hot and cold cups (including coffee cups) are consumed every year and over 90% of coffee cup brands are supplied by its members. The industry group notes a significant growth in the number of brands of compostable coffee cups in the marketplace and has commissioned research from Beyond the Bin to identify where compostable coffee cups can be processed in New Zealand. Alongside this research, they are also investigating whether there are end of life solutions for the range of cups on the market (compostable and traditional plastic/ paper cups).

In 2015 Beyond the Bin conducted a survey of 98 composting facilities and found that 12 facilities were able to process event waste (compostable food packaging and the food it contained from events). The Packaging Forum engaged Beyond the Bin to renew the research to find out how many facilities could now process compostable food packaging waste not restricted to events. The main aim of the study was to identify which composting facilities in New Zealand had capacity and capability to process compostable coffee cups. The survey was extended to look at other types of packaging such as PLA coffee cup lids, other compostable packaging and other items.

The purpose was to interview as many composters as possible within the timeframe allotted for the research. The surveys were undertaken within New Zealand via telephone interviews and a small number of interviews were taken in an online survey format.

The focus areas of the research were agreed as:

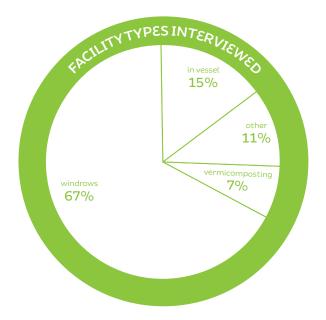
- Experiences with processing compostable packaging including solid Polylactic Acid (PLA)/Crystallised Polylactic Acid (C-PLA)
- Decontamination & shredding practices
- Compostable packaging certification/
 identification
- Barriers and challenges

A working group of compostable packaging manufacturers, waste processors, council representatives and service providers was established by The Packaging Forum to identify data parameters and general direction of the project. The working group met periodically to hear the results of the survey, to inform any directional shifts and to discuss and implement recommendations.

methodology

findings

Using a mixture of research methods a working dataset was constructed. Using an existing database of NZ compost facilities created during a 2015 study ¹, a set of facilities were identified as suitable for inclusion in the survey, having been identified as currently accepting event waste or as a pilot facility (currently developing their capability to be able to process event waste or food packaging waste). Of 39 compost facilities approached between January and April 2017, 27 were deemed suitable for inclusion in the study and interviews were conducted.



Type of composting facility

The most common type of composting facility operation was the windrow process, with two thirds (67%) of facilities interviewed operated this way followed by In Vessel 15%; Vermicomposting 7% and Other 11%.

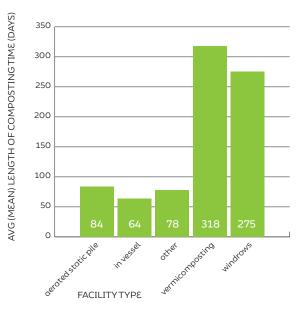
 Windrow facilities are long rows of raw organic matter which are turned mechanically/manually and periodically into new rows, the frequency of turning (and size of the rows) varies greatly, from weekly to six-monthly or even longer. Some windrows operate as aerated static piles which involves covering the windrow/pile of organic matter and forcing air into the pile. This speeds up processing time and raises the temperature of the operation.

- In vessel facilities process organic matter contained within some sort of unit or confined space. This could be a concrete tunnel, inside a building or a mobile mechanical unit
- Vermicomposting in the process of using worms to assist in the breakdown of organic matter to create vermicompost/ vermicast, a high quality fertiliser.
 Vermicomposting is often undertaken in small windrows, but is significantly different to normal windrow composting in that the piles are not mechanically turned.

Length of composting time

One of the 27 facilities interviewed was not willing to provide information regarding their length of composting time. Across all facility types, the average (mean) maximum length of composting time was 216 days (31 weeks) including secondary processing. Across all facility types, the average (median) maximum length of composting time was 180 days (25.7 weeks).

AVERAGE (MEAN) LENGTH OF COMPOSTING TIME (DAYS) AT FACILITIES INTERVIEWED, BY FACILITY TYPE



Maximum heat of composting

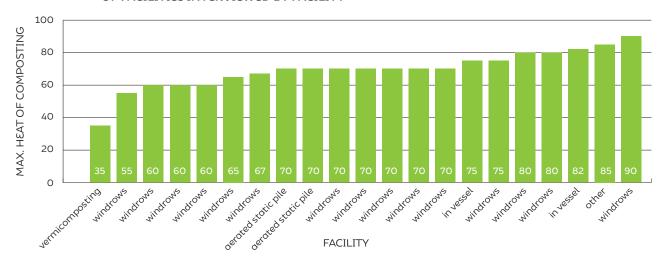
Seven of the 27 facilities interviewed did not provide information regarding the temperature that they operate their compost at; the information below is based on the remaining 20 facilities. Across all facility types, the average (mean) maximum heat of composting was 69.45°C. The average (median) maximum heat of composting was 70°C.

It is worth noting the temperatures indicated are a maximum temperature, not average temperature across composting days. There are naturally fluctuating temperatures during the length of processing time indicated in 5.2 and this would differ by the type and individual processes used at each facility. Some facilities would experience this maximum heat of composting on multiple occasions during the composting process particularly if the organic matter is turned, where the action of turning adds oxygen back into the pile causing it to heat up again.

Secondary facility type information

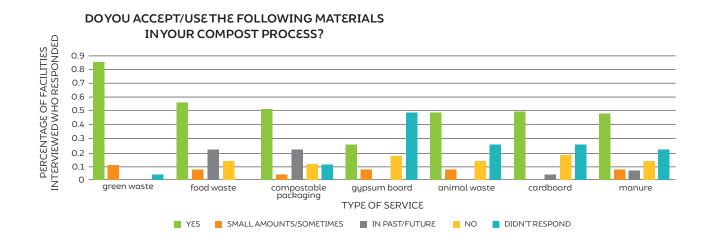
13 facilities had a secondary method of processing materials, usually following the primary method. The secondary types were:

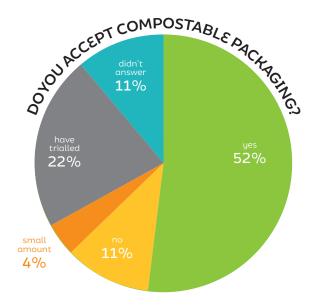
- Slower windrow for larger sized materials
- Windrow mixed with materials that did not break down in primary
- In vessel
- Faster smaller windrow for food waste
- Forced aeration system
- Windrow post in vessel
- Static windrows
- Worm windrows



MAXIMUM HEAT OF COMPOSTING (DEGREES CELCIUS) OF FACILITIES INTERVIEWED BY FACILITY

What are the main materials you accept for composting?

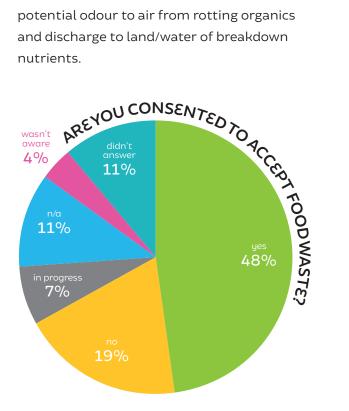




Are you officially consented to accept food waste

- 44% of facilities had a resource consent in place to accept food waste
- two facilities were currently renewing or working on their resource consent to accept food waste
- 48% of facilities did not have a resource consent in place or did not believe they needed one

Resource consents for composting facilities to process food waste commonly are concerned with environmental issues such as potential odour to air from rotting organics and discharge to land/water of breakdown nutrients.



How do these materials arrive to you?

The most common way that facilities received these materials was via commercial drop off, followed by public drop off, then kerbside collection.

Of facilities interviewed:

- 59% accepted commercial drop offs
- 48% accepted public drop offs •
- 37% accepted kerbside organics collection .
- 4% did not respond

Do service providers deliver this product to you?

Among the facilities that accepted organic waste, the most common method of delivery of this material type was via a service provider or commercial waste transport company.

- 59% received materials via a service provider
- 30% received materials via direct delivery from the organics collector
- 11% collected organics themselves (in one • case via a user pays collection service)

Do you decontaminate onsite prior to composting?

15 or 56% of the 27 facilities interviewed employed some sort of decontamination of materials prior to commencing the compost process. This ranged from 'any visible/easily extractable items are pulled out' to a thorough assessment on arrival of materials.

A common thread amongst those who did not decontaminate was that the materials arrived to them clean, some reasons mentioned were the facility's strict requirements, only working with trusted deliverers, or simply that people brought it in clean.

All facilities noted they would only process materials once they had been decontaminated. Some facilities discussed the issues they had experienced receiving contaminated organic waste including compostable packaging with the result being that an overly contaminated load would be removed for landfill disposal. This had in some instances resulted in a facility deciding to reduce or restrict their intake of this waste stream.

- Decontamination can be defined as "the process of removing contaminants from the [organic] waste stream."
- Contaminants in compostable waste streams can be defined as "items which cannot be composted in that particular facility." Common contaminants could

be general rubbish, other recycling, greenwaste treated with toxic herbicides, however this could include specific types of compostable packaging such as PLA or C-PLA in facilities which don't reach the sustained temperatures required to break down these types of materials.

What is the maximum level of contamination?

Among the 12 facilities who provided a figure, the average (mean) maximum level of contamination was 4.25%, and the average (median) maximum level of contamination was 2%. 17 facilities reported their maximum level of contamination as being very low or low (nine and eight respectively).

Eight facilities did not respond to the question.

Have you ever heard of PLA?

19 of the 27 facilities interviewed had heard of PLA. Five had not, and three did not respond to the question.

Have you ever processed...

PACKAGINGTYPE	YES have processed	NO have not processed	NOT SURE	DID NOT RESPOND
Compostable coffee cups (PLA lined)	23 facilities 85%	0	0	4 facilities 15%
Compostable coffee cup lids	17 facilities	3 facilities	3 facilities	4 facilities
	63%	11%	11%	15%
Other compostable bags	18 facilities	3 facilities	2 facilities	4 facilities
(film)	67%	11%	7%	15%
Other compostable food packaging like cardboard, sugar cane, board or wooden cutlery	18 facilities 67% (bagasse/starch products: 6 facilities; wooden/ bamboo cutlery: 11 facilities)	5 facilities 19%	1 facilities 4%	3 facilities 11%
Any other compostable or	Oxo-degradable bags, compostable forks, PE-lined packaging,			
'bio' degradable products?	garden bags			

district vision

Facilities have been identified below. Their processing capability/availability has been defined as per table below. If a facility did not give consent to be promoted as processing compostable food packaging the name of the facility has not been provided.

Compostable food packaging waste processing capability table

YES	Facility is currently able to/ accepting process compostable food packaging and happy to be promoted as doing so
PILOT	Facility is either a) Currently able to process food packaging waste but there is no available service provider or is unhappy with levels of contamination (e.g. service provider does not offer decontamination service) or does not wish to be named as a processor
	 b) Is trialling processing currently
	Is in the process of increasing their capacity to process (e.g. in final stages of consenting

process)

Availability of facilities to process compostable food packaging waste

27 facilities were surveyed, 11 facilities were happy to be listed as accepting compostable food packaging with the additional facilities either being categorised into silent yes, pilot, development or no.

FACILITIES ABLE TO PROCESS COMPOSTABLE PACKAGING

- 1 Home Grown Waiheke Trust, Auckland
- 2 Envirowaste Hampton Downs, Mercer, Waikato
- 3 Envirofert, Tuakau, Waikato
- Revital/Remediation (NZ), Cambridge, Waipa
 Revital/Remediation (NZ), Mt Maunganui, Tauranga City
 Revital/Remediation (NZ), Uruti, New Plymouth
- 7 BioRich, Hastings
- 8 KaiCycle/WorkerBe Oasis, Wellington City
- 9 Capital Compost/Southern Landfill, Wellington City (facility does not process PLA or PLA lined materials)
- 10 Motueka Community Gardens, Tasman
- 11 Innovative Waste Kaikoura, Kaikoura

PILOT FACILITIES TRIALLING COMPOSTABLE **COFFEE CUPS**

summary

The composting industry in New Zealand has some will and/or capacity to process compostable food packaging including coffee cups and in most cases, their C-PLA lids. The barriers they face to process compostable food packaging in their existing operations are varied and significant.

Contamination, lack of identification, length of processing time, volume vs. weight and organic input restrictions are significant issues which affect composter's will and capacity.

The Packaging Forum members which produce/market compostable packaging have an opportunity to positively contribute to solving some of these issues such as lack of identification (create identification and standard) and length of processing time (product innovation/development).

Contamination, volume vs. weight and organic input restrictions are process/regulation related which require a combined effort from waste producers, service providers, regulatory bodies and packaging companies.

The Packaging Forum has already initiated a change to their funding requirement for event recycling, to ensure events are implementing some form of decontamination. Considering that contamination is defined as the products in the incorrect waste stream, education opportunities exist in the public space to promote which products go in which waste stream. The Packaging Forum could extend its support for organisations which are already undertaking education, to deliver this message on behalf of their members.

Volume vs. weight is an important issue, which is solved by providing composters with a good food/packaging ratio. It may not add value to a commercial composter to process large volumes of carbon (food packaging) without significant nitrogen to be able to make a premium product. It is largely the priority of private commercial composters to make a premium product to sell, not to be waste disposal companies (such as is common place in larger cities across the Americas and Europe).

At this time Biogro have indicated they will not be looking to add PLA as an approved input for certified organic composters.

Many composting facilities have special relationships with credible waste producers, those who decontaminate their waste or provide a clean waste stream which the facility wants to process. This means a facility might take (compostable food packaging) waste from one customer, service provider or event who agree to use (composter) approved packaging and are employing decontamination techniques.

The Packaging Forum members can work with their customers and waste producers to enable them to become a credible waste producer, to enable their products to potentially be accepted by a local facility who would otherwise choose not to do so.

recommendations

Identification and logo

- Define clearly who can use a logo and the process surrounding permission granting
- Work with WasteMINZ and any other relevant industry bodies on identification standard to ensure consistency and acceptance of a standard across the nation
- Support research into mislabelled (as bio/degradable/compostable) products
- Product innovations, consider how compostable packaging can be altered to meet a home compost standard, this would allow for products to be processed in all commercial composting processes
- **Trials** with more composters facilitated by WasteMINZ
- More communication with composters through WasteMINZ regarding the packaging industry and compostable packaging

- Offer support for existing waste educators around New Zealand and events with waste education programmes, to collaborate on a combined message of what waste goes in which waste stream
- TPF could support investigation/ investment into standalone compost units as an option for small scale local solutions.

case study | Community Solution Home Grown Waiheke Trust

Home Grown Waiheke Trust is trialling a system on Waiheke Island which they are cofunding with a waste minimisation grant from the Auckland Council. The pilot is currently processing food waste from 170 households, cafes, the local market and compostable packaging from local events.

The composting process uses the traditional box system which comprises of 6 x 1.5m³ boxes which interlock and are portable. A clever design modification allows for organic matter to be dragged (rather than lifted) between the boxes, increasing the ease of manual aeration by moving the contents from one box into the next.

HGWT successfully reach a temperature of 60 degrees within 48 hours and 80 degrees within 72 hours by carefully managing their inputs. They can maintain temperatures of between 60-80 degrees celcius for approximately 6-8 weeks by periodic turning (allowing all materials exposure to the hottest part of the pile). HGWT estimate they have processed approximately 100,000 compostable cups (coffee cups, their C-PLA lids and PLA cold cups) during their trial and have experienced much success by shredding the PLA prior to adding it to the pile.

HGWT recommend adoption of a compostable packaging standard to allow for easy identification of compostable packaging in the organic waste stream – they have a 0% contamination allowance. They have concern over the term biodegradable, as some noncompostable products are using this term, which is causing confusion for the public.

HGWT's composting pilot is a brilliant example of how a community can process their own food waste and compostable packaging waste with a relatively low-cost, low-tech system. A team of passionate individuals combined with a manual solution has led to a successful pilot on Waiheke Island with significant ecological, health, social and community advantages and resulting economic benefits.



case study | Medium Community/Commercial Solution

Innovative Waste Kaikoura processes 700kg/ week of food waste from a local kerbside collection and businesses through their invessel horizontal composting unit. This is mixed with green waste and processed for 30 days through the HCU, then it is rested for 30 days in a static pile and on-sold as fertiliser.

The composting process is done in a long concrete open tunnel approximately 20 metres long which reaches a peak temperature of 78-82 degrees Celsius. The organic matter is moved down the tunnel using a digger which aerates the compost and mixes it.

IWK has processed compostable food packaging from local events including last year processing half a tonne of organics from local event Seafest. The compostable packaging including coffee cups, C-PLA and PLA (and residual food waste) was handsorted by a team of event volunteers trained and managed by event waste education specialists Beyond the Bin. The packaging was not shredded, but was mixed with food waste and put through the HCU successfully. IWK would like to see a compostable packaging standard and some sort of colour coding (for packaging) adopted in New Zealand to reduce confusion about what is and isn't compostable. Contamination of the compostable waste stream is an issue, however current practice is to employ a service provider to decontaminate the waste stream.

IWK is a great example of a commercial organics recycling operation in a horizontal in-vessel system. A co-ordinated approach from the facility, service providers and waste producers through education allows them to run a successful operation and process compostable packaging in their organic waste stream.







contributing to the Working Group



Beyond the Bin beyondthebin.org.nz



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Columbus Coffee columbuscoffee.co.nz



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