

PROMOTION OF BACKYARD COMPOSTING IN  
WINNIPEG: ANALYSIS OF SUPPORTED COMPOSTER  
DISTRIBUTION PROGRAMS

BY

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## ABSTRACT

The thesis examines tools used to encourage residential home composting, specifically government supported bin distribution programs that include education, promotion, advertising and composters offered to the public at reduced cost. The objectives of the research included determining and evaluating the impacts of supported composter distribution programs in Winnipeg; developing and conducting a pilot composter distribution program; and to provide recommendations for current composting programs and initiatives in Winnipeg and throughout Manitoba.

The field research involved two case studies examining unique approaches to bin distribution: A. City of Winnipeg Truckload Composter Sale and B. Rot-to-Your-Yard Home Composter Delivery Program. Important findings from the follow-up surveys administered to City of Winnipeg customers included:

- Approximately 88% of respondents were using their bins;
- Nearly 60% of respondents had little to no experience with home composting;
- “Environmental benefits” & “Affordable price” were the most important reasons for purchasing a bin;
- At least 86% felt satisfied to very satisfied with components of the truckload bin sale;
- Over 80% of respondents would not have purchased the bin at regular price.

The results of the follow-up from the composter delivery program included:

- Approximately 95% were using their bins;
- “Environmental benefits” & “affordable price” were the most important reasons for purchasing a bin;
- At least 93% “Satisfied” to “Very Satisfied” with bin distribution program components; and
- Nearly 68% would not have purchased the bin at regular price.

In comparing the programs, the author discusses the advantages and disadvantages to the different composters and methods of distributing the composters. For instance, the truckload approach offers the most efficient and cost effective method to distributing composters. Meanwhile, home delivery and one-on-one interaction with bin recipients offers an effective means of education and obtaining commitment. In terms of bins, the *Earthmachine* was better suited to smaller lots and households that produce moderate amounts of organic waste. The *Lumberlovers* bin is a more convenient system to use and offers much larger waste diversion potential for households.

Overall, the case studies revealed a high-level of customer satisfaction among survey respondents. Results also illustrate that bin distribution programs that feature reduced bin prices, advertising, composting promotion and education can achieve high preliminary usage rates among customers. Further study however, is necessary to determine long-term composting behaviour. Final recommendations based on the findings include a continuation of subsidized bin distribution; development of a comprehensive bin distribution program; and making education, training and follow-up core components of bin distribution programs. In order for home composting to become the norm in Winnipeg, all aspects of composting and positive impacts it can have on community should be recognized and considered. Consideration of the wide-ranging benefits of home composting can help in developing creative solutions for waste management while also addressing broader environmental and societal issues.

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## **CHAPTER 1 INTRODUCTION**

### **1.1. THE ISSUE OF WASTE**

Municipal solid waste (MSW) represents a complicated management issue with countries all over the world experiencing combined pressures of dwindling landfill space for garbage and the growing public desire for resource conservation and environmental protection through products that are designed for the environment (Sawell and Hetherington 1996). Canada is one of many industrialized nations struggling with both these issues.

Canadians are regularly cited amongst the leading per capita producers of MSW in the world (Sawell and Hetherington 1996; Environment Canada 1996). Statistics show that Canadians generate approximately 20-30 million metric tons per year nationwide (Gies 1997). With a population of just over 30 million that means Canadians produce roughly 600-1000 kilograms (kg) per person (p) per year (yr), with an average generation rate of approximately two to four kg/p/day. Sources of MSW include residential waste, industrial/commercial/institutional (ICI), and construction and demolition (C&D) with each sector representing roughly a third of the waste stream (Sawell and Hetherington 1996; Tammemagi 1999).

Along with the amount of waste being produced come concerns over where it ends up. Despite the increasing presence of “alternative” waste management techniques such as residential recycling and composting programs, landfills remain the dominant method in

North America of disposing of society's waste, symbolizing our "profligate, wasteful, throw-away, over-packaged, and over-marketed consumer lifestyle" (Tammemagi 1999). In Canada, approximately 80% of MSW is landfilled (Sawell and Hetherington 1996; Gies 1997), an expensive undertaking, with annual disposal costs in Canada (including costs related to collection and transportation) estimated at more than three billion dollars per year (Environment Canada 1996). These alternatives must target and remove specific components of the waste stream, thereby minimizing our dependence on landfills.

### **1.1.1 ORGANICS IN THE WASTE STREAM**

Organic material, made up primarily of food scraps, leaves and yard trimmings, paper, and wood makes up a significant portion of MSW. Canadians generate tremendous amounts of nutrient rich organic material that is primarily sent to landfills. Residential sources (households and private residences) generate a major portion of this organic material. According to Kelleher (2001) about 44 per cent of the eleven-million tonnes of waste generated from Canadian households per year (five million tonnes) is organic, consisting of food waste, leaf and yard waste and some non-recyclable paper. As the magnitude of organics expands, many municipalities are recognizing composting of residential organic waste as a viable and necessary alternative to landfilling.

### **1.2 COMPOSTING: THE NATURAL WAY TO REDUCE WASTE**

Composting has the potential to drastically reduce MSW as it is estimated that anywhere between 30-50% percent of the total waste stream is composed of compostable organic material (Martin and Gershuny 1993; Composting Council of Canada 2002).

Composting is a natural process that decomposes and transforms organic material into humus, a valuable soil constituent composed of decomposed plant and animal matter (Martin and Gershuny 1993; Composting Council of Canada 2002). However, standard practices of landfilling of organic waste limits this natural process depleting soils of its natural wealth. Materials such as kitchen scraps, leaves and yard trimmings, paper, wood, manures, and the remains of agricultural crops all have the potential to be diverted through composting. While composting occurs naturally, the process can be managed and accelerated with the help of different human intervention systems, each designed to manage various types and quantities of organic material (Composting Council of Canada 2002). “Backyard”, “on-site”, and “centralized” are examples of composting systems that have enabled municipalities to divert organic waste and return nutrients back to the earth.

### **1.2.1 MAKING THE CASE FOR HOME COMPOSTING**

Backyard composting is viewed as an important method of reducing waste, conserving energy and resources, and improving overall environmental conditions in urban settings. An increase in backyard composting activity offers a number of important environmental and social benefits for communities. Composting conserves resources and reduces pollution by:

- *Keeping quality organics from being dumped into landfills;*
- *Reducing landfill production of methane gas;*
- *Reducing fossil fuel consumption and emission that are otherwise used to transport organic waste to landfill; and*
- *Reducing potential ground water contamination from toxic landfill leachates, and the use of chemical fertilizers. (RCO 1992; CAP No Date)*

Studies have also shown that backyard composting is one of the most cost effective strategies for organics diversion (on a dollar per ton organic waste diverted (Ligon & Garland 1998; EPA 1999). Reviews of backyard composting programs have noted significant social benefits to communities including encouraging a higher level of environmental awareness and attitudes through education, training, and outreach; improved residential acceptance; participation in environmentally sustainable practices; increased capacity for social interaction; and knowledge sharing (CAP 2003).

Greater investment in home composting would serve Manitoba well, which remains one of the highest waste generating provinces in Canada (Manitoba Conservation 1999). The capital city of Winnipeg is by far the greatest source of MSW generating an estimated one tonne/capita/year with a high percentage of organic materials. Of this, 20.1% or an average of 31 709 tonnes/capita/year can be composted at home (Earthbound Environmental 2000; RCM No Date).

### **1.2.2 ENCOURAGING CITIZENS TO COMPOST**

Municipal home composting programs have demonstrated their value in effective and efficient management of organic residuals in communities across North America in both rural and urban settings. Programs are implemented to maximize diversion of household organic waste by maximizing public participation in home composting. This involves the development of promotional and educational campaigns and providing ongoing support. Collecting data on waste diversion and composting rates achieved is another important aspect for ongoing programs. The City of Winnipeg's past commitments to home composting have involved the development and distribution of a home composting



brochure, the delivery of the Leaf it With Us Program and a Don't Bag it – Lawn Care Plan. Winnipeg's primary source for composting education is Resource Conservation Manitoba's Compost Action Project. Examples of services offered by this organization include promotional campaigns involving local media, display booths, composting informational pamphlets, workshops for community groups, maintaining composting demonstration sites throughout Winnipeg, a toll-free composting information telephone line, and a website.

### **1.2.3 BIN DISTRIBUTION: PROVIDING THE TOOLS TO COMPOST AT HOME**

Composter distribution is another common component of municipal home composting programs. These programs help to reduce barriers that prevent residents from home composting. Providing residents with free or subsidized bins increases the convenience and cost of purchasing a composter. Combined with "how-to" education, promotional campaigns, and ongoing support, distribution programs can provide powerful results. The Recycling Council of Ontario (1994) stated that in the early 1990s home composting programs involving composter distribution resulted in dramatic increases in home composting activity ranging from 35% to 181% in various Ontario municipalities.

There has been a recent flood of bin distribution programs in Manitoba (RCM 2003). In April of 2001, the City of Brandon initiated a one-day 'Backyard Compost Bin Distribution Blitz' providing 1155 composters to 860 households for ten dollars each. A follow-up study demonstrated that over 90% of units surveyed were being used at a

desirable frequency rate (City of Brandon 2003)<sup>1</sup>. Finally, after nearly eight years since ending the Composter Rebate Program, the City of Winnipeg held two large-scale, one-day composter bin sales in June of 2002 and May 2003. During each event over 8000 composters were distributed to Winnipeg citizens.

As these types of distribution programs gain popularity in Manitoba, it is important to learn from the experiences of other communities that have had success in integrating these bin sales into waste minimization programs. The impacts of these large-scale sales should be assessed, and customers should be given the opportunity to provide feedback on the bins, the distribution techniques and the overall home composting experience. Engaging public debate and gathering feedback are valuable to improving waste minimization efforts and developing future waste reduction initiatives. Exploring approaches to bin distribution through local networks may also introduce viable alternatives that can: capture different population segments; combine and strengthen efforts for waste diversion; and help build sustainable communities.

### **1.3 DEFINING THE SCOPE OF THE RESEARCH**

“Composting” and “home composting activity” were two terms that needed to be defined in order to clarify the scope of the research and identify the specific purpose and objectives. This research looked at a specific segment of “home composters<sup>2</sup>”, focusing

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<sup>1</sup> The webpage document however does not provide information as to how long surveyors waited after owners received a composter to conduct the survey.

<sup>2</sup> Home composting can refer to composting in single family (houses) and/or multifamily dwellings (apartments, condos, duplexes, triplexes etc).

primarily on single-family dwellings/property (typically owned or rented houses with a backyard) located in private/residential neighbourhoods in Winnipeg (household(s)).

Home composting activity was described by the following composting actions:

- Separating compostable organic kitchen scraps and yard trimmings from a home's waste output (recyclable and non-recyclable); and
- Placing this material into some form of home composting system, which has the potential to reduce total waste output and provide finished compost for its user.

#### **1.4 PURPOSE AND OBJECTIVES**

The purpose of the research was to consider the effectiveness of composter distribution programs in encouraging residents to compost. The main objectives of the research were:

- To determine and evaluate the impacts of supported composter distribution programs in terms of increasing composting activity in Winnipeg and the level of satisfaction of people who purchase a composter;
- To develop and conduct a pilot composter distribution program working with a local business that manufactures composters from recycled lumber;
- To estimate waste diversion potential of the bin distribution programs; and
- To provide recommendations for current composting programs and initiatives conducted in Winnipeg and throughout Manitoba.

#### **1.5 OVERVIEW OF METHODOLOGY**

A series of research activities were conducted in order to help achieve the outlined research objectives. These activities involved a literature review and case study approach. The literature review involved an extensive search for information on general waste management issues, composting, composting principles, and tools that encourage home composting. Evaluations and examples of municipal home composting programs were analyzed to gain insight on techniques and tools used to maximize home

composting participation, challenges to success, and components of a successful program. The literature review also provided background information used to develop the evaluation surveys and the composter delivery program. Key concepts that are summarized by the literature review include integrated solid waste management, waste minimization hierarchy, basic principles of composting and municipal home composting programs.

The field research included Case Study A. *The City of Winnipeg Truckload Composter Sale* and Case Study B. *The Composter Home Delivery Program*. Case Study A examined the City of Winnipeg's composter bin sale administered in June 2002. Case Study B involved developing and piloting a citywide composter distribution program. The program incorporated a number of aspects including a composter sale (\$25.00), composting instructional booklet, promotion and advertising, home delivery and setup of the composter. Both case studies incorporated surveys administered to customers who purchased a composter. Surveys gathered qualitative and quantitative data used to estimate composter usage and customer satisfaction rates and to formulate participant attitudes regarding the bin subsidy programs and home composting.

## **1.6 ORGANIZATION OF THESIS**

The following thesis comprises a total of six chapters. Chapter one provides an introduction to the study, including background, purpose, objectives and an overview of methodology. Chapter two provides an overview of municipal solid waste management, composting and its relevance in solid waste management, and important aspects to

successful home composting programs. Chapter three is devoted to the research methodology and outlines the methods employed during the evaluation survey of the City of Winnipeg composter sale and the composter home delivery program. The results and experience gathered during both field components are discussed in chapter four and five. These two chapters also highlight the difficulties experienced by customers, and discuss limitations of each technique. Chapter six provides a comparison of the two programs, further discussion regarding the validity of supported bin distribution programs. Chapter seven closes by summarizing the research results offering recommendations for future home composting initiatives and concluding commentary about the research.



## **CHAPTER 2**

### **MUNICIPAL SOLID WASTE MANAGEMENT AND COMPOSTING**

#### **2.1 INTRODUCTION**

In order to achieve the objectives outlined in Chapter one, it was necessary to review modern solid waste management (SWM) practices and examine basic waste minimization approaches. This section begins by discussing the problems that exist with solid waste, providing insight into why waste management is necessary. Basic components of SWM are described, which leads into a brief summary of two modern waste management models: integrated waste management and materials resources management. The latter segment of the Chapter provides a summary of composting that includes a description of the concept of composting and general benefits, and a discussion on municipal composting strategies with special focus on home composting programs.

#### **2.2 WASTE: WHAT'S THE BIG DEAL?**

Waste, generally defined as “materials unwanted by its generator”, (Environment Canada 1996) is a permanent fixture in our world and is essential to life. This is an unmistakable fact especially when discussing the cyclical processes of nature, during which waste generated by one organism helps provide sustenance for another. The human by-product of carbon dioxide, for example, is essential to plant growth, while plants produce oxygen, a crucial element to the survival of humans. Clearly, waste is a fact of life. Why then have society's wastes become such a hot topic for cities all over the world?

It is becoming increasingly apparent that society's wastes are placing tremendous stress on the earth's ecosystems as well as the systems we have developed to manage our wastes. Altemeyer (1996) argues that the change in quantity and complexity of the waste generated by society has created an imbalance, described by Tammemagi (1999) as a "waste crisis" that requires immediate attention.

In terms of quantity, developed countries simply produce too much waste. Since World War II, North America has experienced a sharp rise in per capita and total waste generation. Figure 2.1 illustrates the dramatic rise in solid waste generation in the past 40 years (based on U.S. statistics). Several important factors have contributed to this upward trend in MSW production. These include:

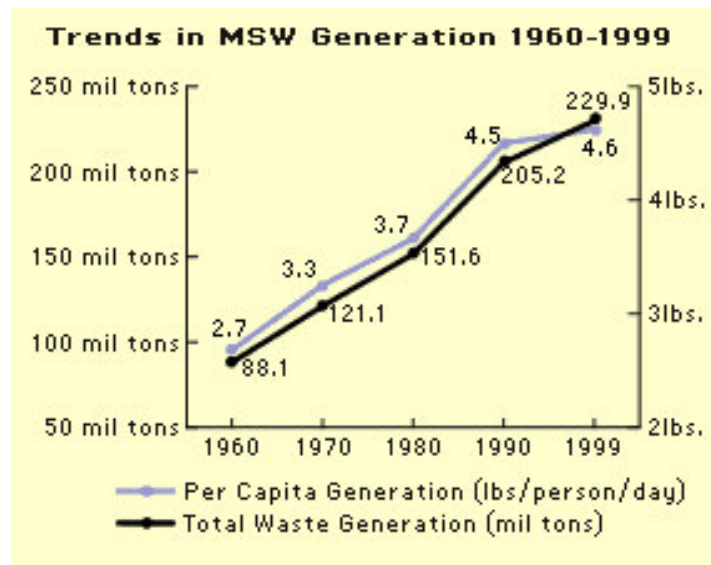
- Large increases in population and consumption;
- Over-packaging of products;
- Disposable products (such as pens, dishes etc.) becoming the norm and replacing products traditionally considered durable; and
- Use of inorganic fertilizers for plant growth in urban and rural farming settings (rather than composting organic material).

(United States Environmental Protection Agency 1999a; United States Environmental Protection Agency 2002; Platt et al. 1991; Martin and Gershuny 1993; Brown et al. 1994; Gardner 1998; Tammemagi 1999).

Canada suffers from similar waste problems. Canadians are regularly cited amongst the leading per capita producers of MSW in the world (Sawell and Hetherington 1996; Environment Canada 1996). Statistics show that Canadians generate approximately



twenty to thirty million metric tonnes per year nationwide, roughly 600-1000 kilograms (kg) per person (p) per year (yr), with an average generation rate of approximately two to four kg/p per day (Gies 1997). In Manitoba, an estimated 950,000 tonnes of waste (840 kg/person/year) was sent to waste disposal grounds in 1996. Manitoba's Capital Region accounts for approximately 60% (560,000 tonnes) of the total waste generated in the province (Manitoba Conservation 1999).



**Figure 2.1 U.S. Trends In MSW Generation From 1960-1999**

*Source: United States Environmental Protection Agency 1999a*

The current waste generation levels and waste constituents are indicative of the wasteful “throwaway society” that has emerged in Western culture. In this society, human progress, which measures success largely upon expansion, growth, and increased consumption, has consequently resulted in increased amounts of “stuff” that is superfluous and unwanted (City of Regina 1999). Brown et al. (1994) describes our throwaway society as one that ...

*...uses so much energy, emits so much carbon, and generates so much air pollution, rubbish that it is strangling itself. Rooted in the industrial concept of planned obsolescence and appeals to convenience at almost any cost, it may be seen by historians as an economic aberration.*

We are faced with a linear material flow that is at odds with the cyclical ecosystems present in nature. Subsequently, MSW management systems have had to grow in size and complexity to manage the current waste stream. MSW is now integral to communities, being required not only to protect human health, but also to protect and conserve natural resources.

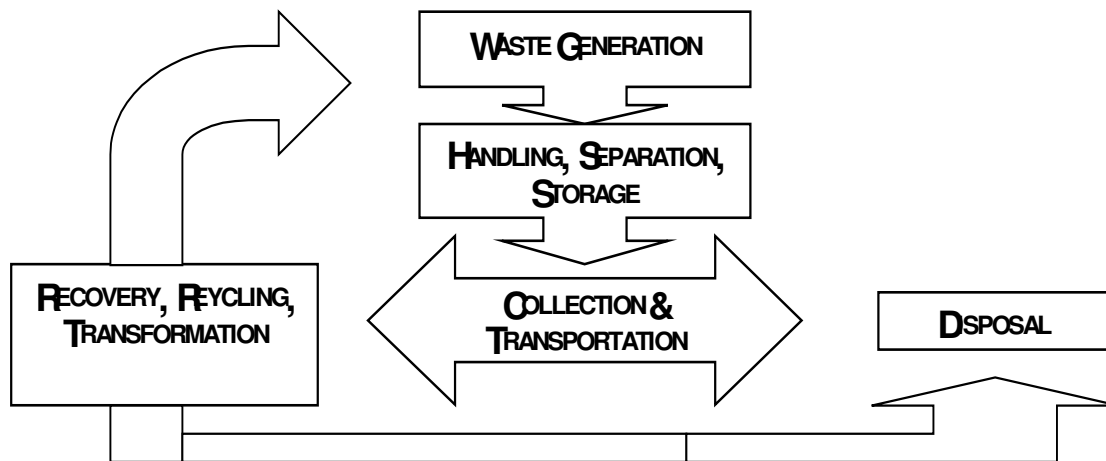
### **2.3 MODERN MUNICIPAL SOLID WASTE MANAGEMENT**

SWM is a significant duty that has local and global implications and has become a necessary component of contemporary society. Furthermore, it involves the provision of services for individual residences and entire communities, allowing large urban centers and smaller rural municipalities to exist and function efficiently (City of Regina 1999). It plays a crucial role in helping to protect human health by containing wastes that can spread disease and create offensive sight and odour problems. Finally, SWM is now being viewed as “an important factor in broader environmental issues with respect to human impacts on the natural environment and the need for those impacts to be understood, measured and controlled” (City of Regina 1999).

During the past century, SWM systems have been forced to grow in size and complexity to confront the changing waste stream. Small, locally based systems have evolved into large, complex, mechanized management systems requiring input from multiple

stakeholders during decision-making and operations (Sinclair and Kuluk 1995). A description of basic components include generation; handling and source separation, storage and processing; collection, transfer and transport; recovery, recycling, transformation; and disposal.

**Waste generation** occurs with every human activity no matter how large or small. Sources of MSW include waste produced by residential, industrial, commercial, and institutional sectors. The second element, **handling, separation, and storage** involves “the placement of wastes in temporary storage containers and the movement of those containers to and from a collection point” (Altemeyer 1996). **Collection** is the point when ownership of waste is transferred from the generator to another party (City of Regina 1999). The fourth element of **recovery, recycling and transformation** involves processes that accept waste as a feedstock material for the creation of new goods and materials or energy (City of Regina 1999). This element also includes activities that are used to reduce the volume of waste and improve ease in disposal. The final stage of SWM is **disposal**, burial of waste at a sanitary landfill for degradation and perpetual storage (City of Regina 1999). These components are depicted in Figure 2.2.



**FIGURE 2.2 BASIC COMPONENTS OF SOLID WASTE MANAGEMENT**

### **2.3.1 DISPOSAL ORIENTED SOLID WASTE MANAGEMENT SYSTEMS**

Despite the increasing presence of residential recycling and composting programs since the 1980s, landfills remain the dominant method of disposing of society's waste and "symbolize our profligate, wasteful, throw-away, over-packaged, and over-marketed consumer lifestyle" (Tammemagi 1999). Canada sends nearly 80% of its waste to landfills (Environment Canada 1996).

There are significant issues surrounding disposal-oriented SWM systems. The costs associated with disposal practices and landfills are a major area of concern. Disposal practices in Canada are estimated to cost more than three billion dollars per year (Environment Canada 1996). These costs include those related to collection and transportation.

While the three billion dollar price tag is staggering, it does not represent all of the environmental or social costs associated with landfills. Despite substantial improvements in landfill technology, there still remain significant costs. For example, anaerobic biodegradation of organic materials in landfills generates toxic leachate that has the potential to seriously contaminate surface and groundwater (Tammemagi 1999). Furthermore, landfills protrude above the surrounding landscape and are exposed to erosion processes, thus requiring additional monitoring and ongoing maintenance (Tammemagi 1999).

The production of atmospheric pollution is another issue concerning landfills. Emissions from landfills have been linked with detrimental local and global environmental impacts. Meanwhile, the decomposition of organic matter within sanitary landfills (which limit oxygen exposure) occurs anaerobically (without the presence of oxygen) (IPCC 2000), generating significant amounts of methane, an important greenhouse gas that is twenty-one times more potent than carbon dioxide in its contribution to climate change (Mitchell 2000).

Disposal-oriented systems also constitute a continuing problem: “existing landfills in Canada are being used up, and suitable new landfill sites accessible from the major sources of waste — the cities — are becoming harder to find and to have approved” (Environment Canada 1996). Many sites across Canada are closing because of stricter environmental regulations or simply because they no longer have the room to

accommodate more waste. In 1999, Manitoba Conservation provided the following account of landfills (referred to as waste disposal grounds) in Manitoba:

*...there are 314 active waste disposal grounds (WDGs) in the province. Over 65% of these facilities are Class Three WDGs serving populations of less than 1,000. Since enactment of the Waste Disposal Ground Regulation in 1991, 127 WDGs have been closed. An additional 100 WDGs are scheduled for closure or further environmental assessment over the next five years. Additional closures may be necessary due to capacity limitations or operating cost concerns in the future.*

Finding new disposal sites is extremely difficult. Landfills compete with essential land use activities including farming and housing for land adjacent to urban centers. The NIMBY (not in my backyard) syndrome is also a major limiting factor to siting new landfills. Environmental hazards and intrinsically unappealing visual characteristics of high truck traffic, flocks of hovering seagulls, and windblown debris have resulted in strong public opposition to landfills making the process of finding new locations near sprawling cities more difficult.

Recently faced with the pending closure of its main landfill, Keele Valley, Toronto struggled to find a new location to deposit approximately 1.35 million annual tonnes of the city's waste. As a stopgap solution, Toronto made agreements to send its waste to Michigan, prolonging the life of the Keele Valley landfill until the end of 2002 (Raflo 2000). With examples such as these, it is clear that alternative waste management practices must be further developed and implemented, thereby minimizing our dependence on landfills.

### **2.3.2 SUSTAINABILITY AND MODERN WASTE MANAGEMENT MODELS**

Over the last forty years, public awareness of environmental issues has changed dramatically. Since the environmental movement of the 1960s, a heightened awareness and concern about issues including “conservation of resources, depleting landfill space, NIMBY syndrome, and environmental degradation through landfill disposal became more formalized (Sinclair and Kuluk 1995). As a result of this heightened awareness, local governments have been pressured by environmental groups and local community organizations to adopt more sustainable SWM policies and practices. As a result, there has been a steady shift away from disposal-oriented policies and towards SWM policies, initiatives and activities that minimize waste and conserve resources for future generations (Tammemagi 1999).

From this emerged a new series of alternative approaches centered on the four R’s of reduce, reuse, recycle, and recover. This hierarchical approach has become a useful and widely used conceptual tool in setting waste reduction targets, organizing waste management operations, and curtailing reliance on landfills. For example, Canada’s national objective of 50% diversion of waste from landfill by the year 2000 is based upon the four R’s hierarchy (National Round Table on the Environment and the Economy 1991; Sawell and Hetherington 1996).

The concept of reduce, reuse, recycle and recover is now an integral component of modern SWM models and municipal programs. The integrated waste management (IWM) model and the materials resources management (MRM) model are prime

examples of the four R's in use. The first model, IWM, refers to the "complementary use of a variety of practices to safely and effectively handle municipal solid waste with the least adverse impacts on human health and the environment" (United States Environmental Protection Agency 2002; Sakai et al. 1996). With this approach, decisions on waste practices take into account all waste streams, collection treatment and disposal methods as well as environmental, economic and social benefits. It includes the 4Rs within a larger hierarchy of source reduction, recycling, combustion and landfilling, again where source reduction is the most desirable option and landfilling is the least desirable. This waste management philosophy has been adopted by most industrialized nations as the menu for developing MSW management strategies (Sakai et al. 1996).

The next logical step to SWM appears to be in shifting the focus from "waste management" to "resource management". This is the focal point for the material resources management (MRM) model (Sinclair and Kuluk 1995). Conservation practices are incorporated during early stages of the waste generating process such as the extraction of natural resources, manufacturing of products, distribution, and advertising of these products (Sinclair and Kuluk 1995). These types of strategies take a broader approach by integrating waste management plans with local land use, economic and business development, and revenue plans, allowing broad integration of resource management into larger community plans (Leroux 2001).



### **2.3.3 COMPOSTING: WHERE DOES IT FIT?**

Composting figures prominently within the SWM models of MRM and IWM. Composting has gained a tremendous amount of recognition in recent years as part of the solution to the waste dilemma. It is viewed as an integral component of the IWM hierarchy, diverting waste from landfills and providing numerous resource management benefits.

Composting targets organic material a major constituent of the municipal waste stream. Organics, primarily of food scraps, leaves and yard trimmings, paper, and wood organics make up a significant portion of materials sent to landfills. Gardner (1998) makes reference to the global significance of organics

*Organic material forms a bulk of the growing mountains of municipal waste... with thirty-six percent of waste flow in OECD member states being food or garden wastes. In developing countries, organic material typically accounts for more than half and often more than two-thirds of the total waste stream.*

In Canada, residences (households and private residences) generate tremendous amounts of nutrient rich organic material sent to landfills. According to Kelleher (2001) about 44 per cent of the eleven million tonnes of waste generated from Canadian households per year (five million tonnes) is organic, consisting of food waste, leaf and yard waste and some non-recyclable paper. As the magnitude of organics expands, many municipalities are recognizing composting of residential organic waste as a viable and necessary alternative to landfilling.

#### **2.3.4 TACKLING RESIDENTIAL ORGANICS WITH COMPOSTING**

Several communities throughout North America have shown that comprehensive composting programs (combined with recycling) are instrumental and necessary in achieving substantial waste diversion rates (Platt 1991; Antler 1999). Currently in Canada, approximately one million tonnes/year of organic waste is being diverted through existing composting programs. However, that leaves behind over four million tonnes of organic material generated from households that still end up in landfills. If the national diversion rate of 50% (a target adopted nationally by provinces) is to be achieved (NRTEE 1991; Sawell 1996; CCME 1989), greater emphasis must be directed towards improving current (successful) composting programs and providing composting services to more municipalities throughout Canada (Kelleher 2001). The following section provides a discussion on basic composting principles and the significant role it can play in waste management.

#### **2.4 COMPOSTING BASICS**

Establishing a definition and providing a list of basic characteristics for composting is a difficult task for a number of reasons. There is a tremendous amount of research and literature written about composting, and as Altemeyer (1996) has pointed out, this available literature has a wide range of often-conflicting definitions. The word composting can refer to something as basic as decomposition of organic matter to something as complex as residential organic waste pick up systems. This often includes municipal collection of organic waste coupled with the production and sale of certified finished compost.

Rather than establishing an all-encompassing definition for composting, this section discusses important aspects of composting including the biological processes involved and composting systems that revolve around human intervention. The research focused on composting as the human practice of collecting and storing and managing organic wastes on site to produce a natural soil amendment. As well, the decentralized method of residential home composting was the central focus of the research.

#### **2.4.1 COMPOSTING IN TERMS OF BIOLOGICAL PROCESSES**

Much of the literature refers to composting in its simplest of forms as decomposition, a naturally occurring process during which organic material undergoes transformation into a soil-like material called humus<sup>3</sup> (Recycling Council of Ontario 1992; Composting Council of Canada 2002). Decomposition of organic matter occurs with the presence of micro-organisms (bacteria) and macro-organisms (fungi and insects). With a combination of proper environmental conditions and adequate time, micro and macro-organisms turn raw putrescible organic matter into a stabilized product (Richard 1996). Through composting, readily available nutrient and energy sources are transformed into carbon dioxide, water, and a complex form of organic matter compost (Richard 1996). (Martin and Gershuny 1993) have also noted the importance of the chemical reactions of oxidation, reduction and hydrolysis that contribute significantly to the decomposition process.

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<sup>3</sup> Valuable soil component consisting of decomposed animal and plant matter.

## **2.4.2 HUMAN INTERVENTION**

Although composting occurs naturally, this natural decomposition can be encouraged by human intervention aimed at manipulating the environmental parameters that influence the composting process, creating ideal environmental conditions. This leads to a more publicly recognized description of composting: the human efforts to manipulate the natural process of decomposition to create a soil amendment from organic wastes (Altemeyer 1996). The practice of composting for human benefit has been utilized by civilizations for thousands of years with literary references that can be traced as far back as the period of ancient Rome (Martin and Gershuny 1993). Many authors, however, speculate that the practice of composting has existed before written text, when basic agricultural practices were first established (Campbell 1998).

## **2.5 WHY COMPOST? BENEFITS TO COMPOSTING**

Composting is a valuable activity that continues to expand throughout North America. The following section summarizes the general benefits of composting. It is important to note that the type of composting operation employed influences the benefits and the magnitude of the benefits incurred from composting.

### **2.5.1 REDUCING WASTE AND LESSENING ENVIRONMENTAL IMPACTS OF LANDFILLS**

Composting has gained considerable attention as a viable solution to the solid waste crisis that is now facing municipalities across North America. Composting is considered the best method for removing millions of tonnes of food wastes and yard trimmings from the waste stream because anywhere between 30-50% of the North America's MSW stream

consists of compostable organic material (Martin and Gershuny 1993, Kelleher 2001). By reducing the organic waste fraction of the waste stream, composting improves many of the problems associated with landfill disposal. Composting programs that divert organic wastes extend the life span of a community's landfill. By extending the life of a landfill, composting minimizes the need for locating and constructing new sites. Composting also removes organic waste that would otherwise decompose anaerobically within landfills.

### **2.5.2 BUILDING HEALTHY SOILS AND ASSOCIATED HORTICULTURAL BENEFITS**

The addition of compost to soils can greatly improve soil texture and structure (Recycling Council of Ontario 1992). Compost contains a high percentage of organic matter that when applied to soils, binds with particles of sand, silt and clay, encouraging the formation of soil aggregates (Campbell 1998). Aggregate formation improves soil structure of poor soils, by facilitating better aeration and water infiltration. By improving soil structure, compost also encourages optimum soil fertility, greater water holding capacity, greater resistance to erosion, protection against drought and nutrient leaching (Martin and Gershuny 1993). Compost also provides valuable nutrients needed for plant growth and releases these nutrients at a rate that parallels a plant's uptake rate (Recycling Council of Ontario 1992; Campbell 1998). Some studies have also found that compost can suppress weed growth and the development of disease pathogens, characteristics that are more prevalent in soils dependent on manufactured fertilizers (Logsdon 1993b; Gardner 1998). Other important horticultural benefits include: neutralization of soil toxins; stimulation of plant growth; buffering soil pH levels; storage of minerals; and

improved root development (Recycling Council of Ontario 1992; Martin and Gershuny 1993).

### **2.5.3 COMPOSTING, CONSERVATION AND CLIMATE CHANGE**

Composting also offers benefits of energy and resource conservation as well as reductions in overall greenhouse gas emissions. Composting reduces the amount of organic waste that decomposes anaerobically in landfills, thus limiting the production of hazardous and explosive landfill gas<sup>4</sup>. Depending on the magnitude of the operation, composting can offer substantial reductions in energy used to transport, sort and process waste for landfill disposal. Small-scale home composting programs for example, have the potential to reduce significant amount of waste while avoiding energy expenditures associated with collection, transportation, processing, sorting of waste for disposal and even centralized composting (Recycling Council of Ontario 1992).

Perhaps the most significant benefits to energy consumption and greenhouse gas (GHG) emissions comes with reduced dependency on chemical fertilizers, which rely heavily on fossil fuels reserves (Martin and Gershuny 1993). The manufacture and transport of chemical fertilizers generates large amounts of CO<sub>2</sub> emissions, meanwhile nitrous oxide (N<sub>2</sub>O) emissions<sup>5</sup> are produced during their use on farming operations (Intergovernmental Panel on Climate Change 2001). The IPCC (Intergovernmental Panel on Climate Change

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<sup>4</sup> Landfill gas is comprised of approximately 50%-60% methane, 40%-45% CO<sub>2</sub> and traces of non-methane volatile organics and halogenated organics (Intergovernmental Panel on Climate Change 2001).

<sup>5</sup> Nitrous oxide (N<sub>2</sub>O) - Soils and oceans are the primary natural source of nitrous oxide. Humans contribute through soil cultivation and use of nitrogen fertilizers, nylon production, and the burning of organic material and fossil fuels (Environment Canada 2001)

2001) indicates that the use of compost for farming can reduce fertilizer requirements by at least 20% thereby significantly reducing net GHG emissions.

#### **2.5.4 COMPOSTING AND SOCIO-ECONOMIC BENEFITS**

Along with its inherent environmental advantages, composting can also provide significant economic and social benefits for communities and local governments. Increased composting of municipal organic waste can help reduce costs related to landfilling waste, collection of garbage and tipping fees (United States Environmental Protection Agency 1999b). Economic analyses of various municipal composting projects across North America, have shown that composting is by far the cheapest means of waste disposal (Martin and Gershuny 1993). Municipal programs that encourage home composting can also create employment opportunities and promote volunteerism (RCM 2003).

Many authors also view composting as an important tool for social development. Since composting can be a decentralized and natural source of soil nutrients, composting offers hope for improving conditions for the urban poor by encouraging urban agriculture, which provides many benefits as described by (Gardner 1998)...

*For the urban poor compost is a virtually free fertilizer and soil builder, whose production requires little space, virtually no equipment, and a modest amount of labour. Such a valuable and affordable resource available without reliance on outside supplier can make an economic and nutritional difference for to people living on the economic margin.*

In developed countries urban agriculture and composting projects have become part of larger community initiatives for urban renewal, creating opportunities for positive social

interaction and institution building; and integrating environmental sustainability as an important community value. Programs in New York and Chicago have developed on-site composting programs to provide finished compost to reclaim lots and fertilize community gardens (Rockwell 1994). The “Y Worms” project, a grassroots vermi-composting operation, currently works in one of the most impoverished neighbourhoods in Milwaukee, enabling youth to build a micro-enterprise, with vermi-culture and organic herb production as the centerpiece. Training and community development will help youths develop concrete life skills, increase personal income and grow nutritious food for their families and communities (Heifer International 2004). In Waterloo, Ontario compost bin sales were to encourage the public to bring in perishable donations for the local food bank (Gombos 1994). Finally, Frengl (2001), cited that a food bank in Eugene, Oregon managed urban garden programs and provided community benefits such as:

- Opportunities for low-income residents to become self-sufficient in organic food production;
- Reducing organic waste generated by grocery stores; and
- Educating the public about the methods and benefits of composting.

## **2.6 COMPOSTING INDUSTRY SURGING**

As the benefits to composting become more evident, its use in communities throughout North America continues to grow rapidly. In Canada, for example, various types of composting programs now divert over a million tonnes of organic waste from landfills (Kelleher 2001). A national survey of composting industries in 1998 revealed that there was an estimated 344 centralized composting facilities that produced approximately 845 400 tonnes of finished compost (Antler 1999). Residential organic waste collection and



processing plants now operate in a handful of Canadian communities including Guelph, St. Thomas and Caledon in Ontario; Halifax, Lunenburg, and Bridgewater in Nova Scotia; East Prince, PEI; and, Westmorland Albert in New Brunswick (Kelleher 2001). In Edmonton, Alberta the current co-composting facility receives all of the City's residential wastes City along with biosolids from municipal wastewater treatment facility. The facility is expected to help divert approximately 70% of waste from landfill while producing an average of 300 tonnes of compost a day to be used in land reclamation, commercial landscaping and agricultural applications (Vitello 2001).

Even traditional small-scale at home composting practices have received considerable support. Urban gardeners and home composters now have a wide array of commercial composting units (bins) available that allow them to make compost quickly and easily (Martin and Gershuny 1993). Municipal home programs have been implemented throughout communities in North America to encourage home composting by providing such services as composting education, promotional material, troubleshooting information, and convenient access to compost units for residents. These types of programs have enjoyed continued success and gained favourable recognition as a viable method of reducing waste and energy consumption.

## **2.7 ORGANIC MATERIALS MANAGEMENT STRATEGIES**

With municipal composting programs growing rapidly in North America, it is important to provide information on different types of programs and to offer some distinction between them. In recent years, North American municipalities have implemented

numerous composting systems or “organic materials management strategies” (OMMS) to divert organic materials from landfills (United States Environmental Protection Agency 1999b). Yeager and Snell (1989) provide a simple method for classifying composting systems by organizing them according to the “level of investment and mechanization that is required: low, medium (intermediate) and high”. Each composting system is designed to manage various types and quantities of organic materials. Therefore, choosing and implementing a successful program depends largely on factors such as quantity and type of materials and what is most appropriate for the community (Ligon and Garland 1998; United States Environmental Protection Agency and Institute of Local Self Reliance 1999; United States Environmental Protection Agency 1999b). Options include small to large-scale municipal programs. The thesis research focuses on small-scale municipal composting programs that encourage residents to compost food and yard residuals at home.

### **2.7.1 SMALL SCALE MUNICIPAL COMPOSTING PROGRAMS**

Low technology programs include source reduction methods such as grasscycling and backyard composting and represent a decentralized approach to organic waste management. They use a minimal amount of technology; require little capital investment while avoiding costs related to collection and landfilling of wastes. These types of strategies rely heavily on public participation to succeed (Yeager and Snell 1989). Therefore, widespread public education and promotion are necessary components. By encouraging greater public participation and offering education, these types of programs provide an excellent mechanism to increase the awareness of people regarding waste

management issues and allow households to become personally involved in providing solutions to waste management problems (Yeager and Snell 1989).

### **2.7.1.1 Grasscycling**

Grasscycling programs target grass clippings portion of the waste stream and encourage residential, commercial and institutional establishments to grasscycle rather than bagging and setting them out for collection (United States Environmental Protection Agency 1999b). “Grasscycling” refers to the practice of leaving grass clippings on the lawn after mowing. Grass clippings will dehydrate and decompose, quickly disappearing while adding nutrients to lawns. Programs consist primarily of public education and promotional efforts that provide basic information on reasons for grasscycling as well as proper grasscycling methods. Staff time for public education and promotional material often accounts for all the costs associated with grasscycling programs (Ligon and Garland 1998). In some cases, municipalities will offer subsidies or rebates to reduce the cost of mulching lawnmowers or to retrofit non-mulching lawnmowers (Ligon and Garland 1998; United States Environmental Protection Agency 1999b). Many grasscycling campaigns are done in conjunction with home composting efforts. The City of Winnipeg and the Compost Action Project both promote grasscycling in Winnipeg. They have worked together to develop the Don’t Bag it Lawn Care Plan brochure and grasscycling information sheets which serve to educate citizens of the benefits to grasscycling.

### 2.7.1.2 Home Composting Programs

Home or backyard composting programs encourage residential homeowners to separate and compost as much of their organic wastes as possible at the home. Home programs encourage households to compost through a variety of methods that may include outreach, bin subsidization and distribution, education, training, and workshops. These elements will be discussed in greater detail in a later section of the document entitled “Keys to Successful Home Composting Programs”.

Home programs generally target biodegradable waste including kitchen waste such as fruits and vegetable scraps, eggshells, coffee, tea bags, and soiled paper towels and yard trimmings such as grass clippings, leaves and garden wastes. Home programs tend to discourage adding meats and dairy products (because they can cause odours and attract pests) and yard trimmings recently treated with pesticides and herbicides (See Table 2.1).

**TABLE 2.1 COMPOSTABLE MATERIALS RECOMMENDED BY HOME COMPOSTING PROGRAMS**

MATERIALS TO INCLUDE		MATERIALS TO EXCLUDE
Aquatic plants	Sawdust	Bones
Bread	Straw	Pet manure (e.g., dog, cat)
Coffee grounds	Sod	Dairy Products
Egg shells	Tea leaves	Diseased plants
Farm animal manure (e.g., sheep, cow, horse, poultry)	Twigs and shredded branches	Fish scraps
Fruit	Vegetables	Lard
Garden trimmings	Wood ash	Mayonnaise
Grass clippings	Wood chips	Meat scraps
	Hair clippings	Peanut butter
	Leaves	Salad/cooking oils
	Soiled or non-recyclable paper	Salad dressing

*Source: United States Environmental Protection Agency 1997*

### ***2.7.1.2.1 HOME COMPOSTING METHODS***

Although the modern practice of composting has evolved since its simple beginnings, it remains essentially the speeding up and intensifying of the natural process of decomposition (Campbell 1998). It is a dynamic process, which can occur quickly or slowly, depending on the process used and the skill with which it is executed. Even if left alone, piles of dead organic material will eventually decompose. This is often referred to as "passive composting," because little maintenance is performed. Fast or "active" composting can accelerate the process considerably by manipulating fundamental factors that influence microbial activity. These include:

- Carbon to nitrogen ratio;
- Oxygen levels;
- Surface area;
- Moisture content; and
- Temperature.

Composting methods are described by (Martin and Gershuny 1993) as forming a continuum from quick, "hot" (active) composting techniques to slower, "cold" (passive) composting techniques. Table 2.2 provides a summary of the advantages and disadvantages of active and passive composting techniques.

Passive composting is certainly the easier of the two techniques requiring little effort and maintenance. A cold compost pile can be maintained as an open pile (or enclosed in a holding bin with new material merely added to the top of the pile) (United States Environmental Protection Agency 1997). Materials in a cold compost pile degrade at a much slower rate since no effort is made to mix and aerate the materials (United States Environmental Protection Agency 1997). Open pile, cold composting is generally not

recommended for the composting of food scraps or diseased plants because it fails to reach high temperatures at a long enough duration to kill pathogens or weed seeds (United States Environmental Protection Agency 1997; Martin and Gershuny 1993).

Active composting methods are useful for composting food and yard wastes together, producing compost in a shorter period of time (Recycling Council of Ontario 1992). Finished compost can be produced as quickly as six to eight weeks through hot composting methods (United States Environmental Protection Agency 1997). Meanwhile high temperatures that exist can limit the survival of weed seeds and pathogens (Martin and Gershuny 1993). The major disadvantage is that maintaining this rapid degradation rate and temperature levels involves more effort with frequent mixing required to aerate the pile and control its moisture content (United States Environmental Protection Agency 1997).

**TABLE 2.2 ACTIVE VS. PASSIVE COMPOSTING:  
PROS & CONS OF HOT AND COOL COMPOSTING**

	<b>Pros</b>	<b>Cons</b>
<b>Hot/Active Composting</b>	<ul style="list-style-type: none"> <li>• Produces finished compost quickly</li> <li>• Uses space efficiently</li> <li>• Builds fertility quickly for new garden locations</li> <li>• Kills most weed seeds and pathogens</li> </ul>	<ul style="list-style-type: none"> <li>• Is labour intensive</li> <li>• Requires careful control of moisture and C/N ratio</li> <li>• Conserves less nitrogen</li> <li>• Materials added all at once, heat will be released if material added continuously</li> <li>• Beneficial soil microbes can be killed by high temperatures</li> </ul>
<b>Passive/Cool Composting</b>	<ul style="list-style-type: none"> <li>• Needs little maintenance</li> <li>• Preserves beneficial soil microbes</li> <li>• Conserves nitrogen</li> <li>• Allows materials to be added little at a time</li> </ul>	<ul style="list-style-type: none"> <li>• Allows nutrient loss through extended exposure to elements</li> <li>• May take 6 months to 2 years to produce finished compost</li> <li>• May fail to kill pathogens or weed seeds</li> <li>• Needs balanced carbon and nitrogen, as well as wet and dry materials, as you add to pile</li> <li>• Produces compost with more non-decomposed bits of high-carbon materials</li> </ul>

*Source: Martin and Gershuny 1993*

#### **2.7.1.2.2 COMPOSTING BINS**

Composting bins fall under two main categories: holding units and turning units (RCO). Each type offers several advantages that have made them popular for home composters. The common advantage for all containers is that they maintain the shape of a compost heap, keeping it neat in appearance. The following section summarizes holding and turning units.

Holding units are designed to contain the compost pile in an organized manner until materials breakdown. They are easy to set-up, require little maintenance other than

continuously adding materials, and are generally inexpensive. Most holding units are designed to simply add material and provide limited access to a compost pile for turning. With less turning involved, compost will take longer to form, taking anywhere from six months to two years to form (depending on frequency of turning, moisture conditions and amount of material added). Holding units can be made of a number of different materials. Chicken wire or hardware cloth can be used to build units that are easily assembled and can be moved around to a new location. Wire bins tend to lose more heat and moisture than bins with solid sides so decomposition is slower (Campbell 1998).

Wood pallets can be used to build adequate holding units that offer a low cost alternative while keeping pallets from the waste stream. By simply building a swinging gate with the front pallet, it can also serve well as a turning unit (Compost Action Project and Resource Conservation Manitoba 2002). Items such as garbage cans or barrels can be turned into effective holding units. Cinder blocks or bricks can be used to create more stationary enclosures.

There are also a number of commercial holding units that can be purchased. Most are made of post consumer plastics and offer advantages such as quick set-up time, attractive appearance, increased protection from moisture and heat loss, increased protection from rodents, and access doors to finished compost (Campbell 1998; Recycling Council of Ontario 1992). Most of these bins have the disadvantage of containing less than 1 cubic yard of material (the minimum size often recommended for hot composting) limiting the



volume of material that can be composted. Prices vary from model to model ranging from as low as \$30.00 to over \$100.00.

Turning units are bins that are designed to provide easy access to a compost heap for mixing. Regular turning, taking a compost pile apart and restacking it, ensures that oxygen and fresh organic materials are evenly spread throughout the pile. Providing the micro-organisms in the compost pile with an adequate supply of oxygen aids the composting process and can significantly reduce the amount of time it takes to produce finish compost. Compost may be produced in a period of about a month to a year depending on frequency of turning, moisture levels and amount of material. The drawbacks to using turning units are that they require much higher effort level to maintain.

There are several different turning unit models that can be constructed. The New Zealander model can be built from new or recycled wood and features a removable front gate and black plastic cover. Three-bin units allow for multi-stage composting. Fresh material is added to one bin, then turned and shovelled into the next bin. Finished compost is removed from the final bin. This type of system is designed to handle the most demanding waste volumes, capable of effectively handling large amounts of waste material while generating compost at a rapid rate.

A rotating system consisting of a metal barrel suspended on a stand to facilitate turning of the entire barrel and mixing of the organic materials is another option. As well, tumblers

are plastic versions of the rotating barrel design that can be purchased at garden centers. This design facilitates greater ease of turning without the need for back labour with shovels or pitchforks. Drawbacks to the rotating design are that they are much more complicated to build and costly to purchase (either the materials or the plastic design). As well, for best results, the literature recommends adding materials all at once to reduce heat loss from the enclosed container. Thus storage of waste materials prior to transfer may be necessary (Campbell 1998).

#### ***2.7.1.2.3 CHOOSING THE RIGHT HOME COMPOSTING SYSTEM***

With such a variety of methods available to each household, it is important to note that there is no definitive model of composting that is best for every household. Each system has its own respective advantages and disadvantages that can cater to different lifestyles, financial constraints, needs and preferences. Assessing a person's situation becomes important in choosing the most appropriate composting system. Table 2.3 offers criteria for households to consider in selecting a composting system. These include: the amount of work resident is willing to devote to composting; available space in the yard; the rate at which one wants to produce finished compost; the amount of money person willing to spend on a system; aesthetics; degree of pest and rodent resistance; and the type of living arrangement. Table 2.4 provides a summary of advantages and disadvantages of common composting systems.

**TABLE 2.3 CRITERIA TO CONSIDER SELECTING AN APPROPRIATE COMPOSTING SYSTEM**

Time/Labour	How much time and labour are you willing to spend on
Space	How much space do you for composting?
Materials	How much kitchen and yard waste do you produce? How much finished compost do you need?
How Fast	How quickly do you want to have finished compost?
Cost	How much do you want to spend on making or buying a compost
Appearance	How important is it to have an attractive compost system?
Pest Control	How much pest proofing is needed?
Living	Do you live in a house or an apartment?
Source: (Recycling Council of Ontario 1992)	

**2.7.2 MAKING THE CASE FOR HOME COMPOSTING**

Organic materials management requires a variety of approaches that involve all segments of society. Based on the variety of sources, it is logical to assume that there is no single composting strategy that can manage all of the organic waste sent to landfills. Small-scale to large-scale approaches have their respective advantages and disadvantages in terms of cost, effectiveness and sources of organic waste targeted. For the reasons outlined below, a decentralized form of composting is, however, viewed as offering the most advantages.

**2.7.2.1 Advantages of Home Composting Programs**

Small-scale source reduction methods such as home composting programs and grasscycling are integral components of a comprehensive organic waste management program. These types of grass-roots approaches should be the first composting option used by municipalities and householders. They offer a low cost process that is easily managed by municipal leaders and households (Yeager and Snell 1989). They avoid the

**TABLE 2.4 COMPOSTING SYSTEMS AT A GLANCE**

<b>Type</b>	<b>Advantages</b>	<b>Disadvantages</b>
<b>Slow Outdoor Pile (also mulching, soil incorporation)</b>	Easy to start and add to; low maintenance	Can take a year or more to decompose; nutrients are lost to leaching; can be odorous and attract animals and flies
<b>Hot outdoor pile</b>	Fast decomposition; Weed seeds and pathogens are killed; More nutrient-rich because less leaching of nutrients; Less likely to attract animals and flies	Requires lots of effort to turn and aerate and manage the process; Works best when you have lots of material to add right away; as opposed to a little bit at a time
<b>Bin or Box</b>	Neat appearance; Holds heat more easily than a pile; Deters animals; Lid keeps rain off compost, limiting leaching of nutrients; If turned decomposition can be rapid	Requires investment in money to buy bin or buy materials to build a bin; Requires investment in time to build composter; Limitations to amount of material that can be placed in bin due to limited volume
<b>Tumbler</b>	Self-contained and not messy; Can produce quick compost; Relatively easy to aerate by turning; odor not usually a problem; no nutrient leaching into ground	Tumblers are costly; Volume is relatively small; works better if material is added all at once
<b>Pit Composting</b>	Quick and easy; no maintenance; No investment in materials	Only takes a small amount of organic material
<b>Sheet Composting</b>	Can handle large amounts of	Requires effort to till material into the
<b>Plastic Bag or Garbage Can</b>	Easy to do year-round; can be done in a small space; can be done indoors; Requires no back labor	Mostly anaerobic resulting in bad odors; Can attract fruit flies; Need to pay attention to Carbon/Nitrogen ratio to avoid slimy mess
<b>Worm Composter</b>	Simple to start and maintain; No odors; Can be done indoors; Materials can be added continuously; Generates finished compost quickly; Worm castings are extremely nutrient rich	Costs involved in purchasing special worms, worm bin; Requires some care when adding materials and removing castings; Need to protect worms from temperature extremes; Can attract fruit flies

Source: (Campbell 1998)

financial costs associated with the operation of a centralized composting facility. As well energy, resources and fuel are conserved while air emissions from the collection and transportation of organic waste are avoided (Recycling Council of Ontario 1992). The decentralized nature of these types of programs means that waste reduction can begin immediately without waiting for a facility to be approved or built (Recycling Council of Ontario 1992). They also do not require ongoing government inspections or regulations that centralized composting systems are subjected to (Yeager and Snell 1989).

*Backyard composting has no collection cost and virtually no operating cost. It is this almost total reliance on modest capital cost with long amortization that will make backyard composting so attractive to municipalities financially.*

These types of programs also enable individuals to witness the direct results of their efforts (Recycling Council of Ontario 1992). Home composting provides a free soil supplement to individuals that can save residents money normally spent on store purchased fertilizers (First Consulting Group and Recycling Council of Ontario 1994; Compost Action Project and Resource Conservation Manitoba No Date).

Perhaps the most important benefit is that these programs provide an excellent mechanism to increase environmental awareness of individuals regarding waste management issues and other sustainable lifestyle choices (Yeager and Snell 1989). Home composting programs provide residents with a greater opportunity to be part of the solution to environmental problems; reinforcing the idea that citizens need to take greater responsibility for the waste they produce (Compost Action Project and Resource Conservation Manitoba No date; Recycling Council of Ontario 1992). Participants become far more aware of the amount of waste they generate as a result of managing it

within their homes (Gordon 1998). Logsdon (1993a) suggests that... “So much of success in managing waste is attitude. You can't solve the waste problem until you change society's attitude. And you won't change attitude until you put the responsibility back into every home and every office.”

Now that home programs have established themselves in municipalities across North America, there is also strong evidence that small-scale composting strategies are the most cost-effective approach available. In their analysis of U.S. composting strategies, Ligon and Garland (1998); and the United States Environmental Protection Agency (1999b) state that three decentralized methods of source reduction (grasscycling, on-site institutional and home composting programs) could target up to 50% of the organic waste stream at a net savings of over one billion US dollars annually. In fact, maximum savings and diversion would be achieved through a combination of grasscycling, on site institutional composting, home composting and commercial organics composting. Ligon and Garland (1998) estimate that up to 30.6 million tons of organic materials could be targeted nationally in the United States through BYC programs. Table 2.5 provides a summary of individual composting strategies, comparing the associated costs of each strategy. Table 2.6 is a summary of composting strategies that result in a net savings while Table 2.7 summarizes the combination of composting strategies that offers maximum savings and diversion potential. Each table shows the cost effectiveness of small-scale programs particularly that of home programs. The remainder of this document will focus specifically on home programs.

**TABLE 2.5 SUMMARY OF INDIVIDUAL ORGANIC MATERIALS  
MANAGEMENT STRATEGIES**

<b>Strategy</b>	<b>Strategy Description</b>	<b>Materials Targeted</b>	<b>Available Tons (Millions/Yr)</b>	<b>Range (\$/Ton)</b>	<b>Mid-Range (\$/Ton)</b>
<b>Grasscycling</b>	Primarily education & Promotion, some financial incentives	Residential and commercial grass	14.0	.26-7.04	1.00
<b>Home Composting</b>	Education promotion, bin distribution and other financial incentives	Residential Yard trimmings and food waste	30.6	5.00-15.68	12.90
<b>On-site Institutional Composting</b>	Institutions such as universities, correctional facilities, and military bases, collect and compost organic materials on-site	Institutional food, select paper grades, and yard wastes	2.4	29.00-98.00	49.00
<b>Municipal Yard Trimmings Collection &amp; processing</b>	Dedicated collection and processing of leaves, grass, and brush	Residential and commercial yard trimmings	28.0	21.65-88.21	55.00
<b>Commercial Composting</b>	Dedicated collection of targeted materials; processing offsite	Food and select paper grades	24.6	50.00-144.00	72.00
<b>Mixed Waste Composting</b>	Standard garbage collection; separation of compostable waste at a single facility; composting of organic materials	All commercial and residential organic waste	74.7	102.00-126.00	113.00
<b>Residential Source Separated Organics</b>	Dedicated collection of targeted materials; processing at a central facility	Select paper Grades, good and yard trimmings	47.3	N/A	N/A

*Source: United States Environmental Protection Agency 1999b; Ligon and Garland 1998*

**TABLE 2.6 COST/SAVINGS COMPARISON BETWEEN  
COMPOSTING STRATEGIES**

<b>Compost Strategies that Produce Net Savings</b>	<b>Mid-Range</b>	<b>Avoided Disposal (\$/ton)</b>	<b>Revenue/Input (\$/ton)</b>	<b>Savings (\$/ton)</b>
<b>Grasscycling</b>	1.03	38	0	36.97
<b>On-site</b>	49.00	61	20	31.58
<b>Institutional</b>				
<b>Home Composting</b>	12.90	38	0	25.10
<b>Yard Trimmings</b>	66.02	61	16	10.86
<b>Commercial Organics</b>	72.00	61	20	8.58
<b>Mixed Waste</b>	113.00	102	2	-9.28

*Source: (Ligon and Garland 1998, United States Environmental Protection Agency 1999b)*

**TABLE 2.7 SAVINGS FROM COMPOSTING STRATEGIES**

<b>Composting Strategies that Produce Net Savings</b>	<b>Tons Targeted (millions)</b>	<b>Avg. Savings to Local Government Per ton Diverted (\$)</b>	<b>Total Potential Savings (Millions \$)</b>
<b>Grasscycling</b>	14	37	518
<b>On-site</b>	2.5	32	77
<b>institutional</b>			
<b>Home Composting</b>	21.9	25	549
<b>Commercial Composting</b>	24.6	9	212
<b>Total</b>	63		1,356

*Source: (Ligon and Garland 1998, United States Environmental Protection Agency 1999b)*



### **2.7.2.2 Predictive Variables to Composting Behaviour**

In a study designed to distinguish between composters and non-composters McKenzie-Mohr et al. (1999) outlined important variables to predicting household composting behaviour. Convenience to composting was viewed in two ways: convenience of obtaining a composter and the perceived convenience of carrying out the ongoing activity of composting. Home composting is often perceived as time-consuming and unpleasant. The stigma that some people place on composting can lead to a lack of participation. Composting-related expenses include the cost of purchasing a composter. There generally is no shortage of composting units and systems available on the market. However, several high quality systems can range from \$60.00 to \$200.00, making them cost prohibitive for low-income households or for beginners that are apprehensive about investing high amounts into composting. Conversely, households may decide to compost due to the money saved by decreasing the need for store-bought fertilizers for their gardens or reducing residential solid waste levies (if applicable to the municipality). Environmental benefits such as reduction of household waste generation and improving soil quality, appear to be a highly rated reason for citizens to start and continue to compost. Social norms and diffusion refer to implicit rules regarding how people should behave. People frequently base their actions upon what they believe others deem to be appropriate behaviour. Friends and family have the ability to greatly influence behaviour such as the uptake of new technologies and activities. In contrast to curb-side recycling which serves as steady reminder of community norms, composting is carried out in the backyard. Thus, there is significantly less opportunity for social norms to play a role. Master composter programs, which involve residents in the community teaching training

peers how to compost, have been very successful in encouraging composting social norms and fostering greater participation rates (Block 1998). Climate is another factor that helps to distinguish those that compost year round versus those that are considered “fair-weather” composters.

### **2.7.2.3 Keys to A Successful Home Composting Program**

*The cornerstone of sustainability is delivering programs that are effective in changing people's behaviour. If we are to make the transition to a sustainable future, we must concern ourselves with what leads individuals to engage in behaviour that is collectively sustainable and design our programs accordingly (McKenzie-Mohr and Smith 1999).*

Several sources highlight key program components that encourage high participation rates (Compost Action Project and Resource Conservation Manitoba 2001; Johnson 1998; First Consulting Group and Recycling Council of Ontario 1994). This document will focus on six key areas: education and outreach, promotion and publicity, ongoing education and promotion, bin distribution, and evaluation and monitoring participation. It is important to note that these elements are most effective when implemented together.

#### **2.7.2.3.1 EDUCATION AND OUTREACH**

Providing composting education is a long-term process that is essential to the success of a program. Composting education programs can have a number of different objectives. They can provide detailed information and training for individuals on how to perform required tasks for successful composting, how to fix problems and where to get answers to questions and concerns (First Consulting Group and Recycling Council of Ontario 1994). Education can also aim to dispel negative myths and attitudes towards composting. A good educational program serves to inform the public about the benefits

composting offers individuals (e.g. free fertilizer) and communities (e.g. waste diverted from landfills) and how it fits into the broader environmental perspective.

The literature highlights the tremendous changes in delivering composting education that have occurred over the past twenty years. Most successful composting programs now combine a number of educational approaches that range from providing basic informational brochures to offering outreach activities such as the master composter volunteer programs that promote greater public involvement. Participants in programs involving public and community interaction are more likely to continue composting for years to come sharing composting information with family and friends (Sherman 1997; Vossen and Rilla 1997).

The experience from existing home composting programs provides insight into what educational methods are most successful. Previous experience has demonstrated the need to tailor educational activities to the specific audience (children, ethnic groups, gardeners) where possible (First Consulting Group and Recycling Council of Ontario 1994). Past experiences have also demonstrated that education and outreach are much more effective when personal contact is utilized. Thus, small group presentations, demonstration site tours, staffed fair booths, workshops, classroom lessons, door-to-door campaigns, one-on-one talks with neighbours or friends can have a greater effect on participation rates (Johnson 1998). Establishing community links and creating social networks between local environmental and community-based organizations and government is also recommended for disseminating information and promotional

purposes (First Consulting Group and Recycling Council of Ontario 1994; McGovern 1997; Sherman 1997; Vossen and Rilla 1997).

#### ***2.7.2.3.2 PROMOTION AND PUBLICITY***

Promotion is another key to successful home composting programs. Promotion and publicity gives a program visibility, creates awareness for the program, and raises public interest in composting and in program activities (workshops, compost events, etc) (First Consulting Group and Recycling Council of Ontario 1994). A promotional campaign informs people of the program, gives them the initial push to get started and offers continual reinforcement of positive composting messages (First Consulting Group and Recycling Council of Ontario 1994). Promotional activities can also be coupled with education, increasing public awareness of the benefits of home composting. This increased awareness of the benefits of composting represents an important step for households in becoming actively involved in composting (Johnson 1998; Gardner and Stern 1996).

#### ***2.7.2.3.3 ONGOING EDUCATIONAL SUPPORT AND PROMOTION***

Ongoing education and promotion is required after a program's initial push. First Consulting Group and Recycling Council of Ontario (1994) provide a number of reasons why ongoing education and promotion are vital to a program. These include:

- “Composting is still a new idea to many people, people need to hear message many times before acting on it;
- Separating and composting food is a more difficult behaviour change than recycling;
- New composters require access to information and support so they do not become discouraged and stop composting; and
- Transient nature of urban populations makes ongoing promotion necessary.”

Programs throughout North America use several common methods to provide ongoing educational support and promotion. Telephone hotlines using paid staff or volunteers can provide residents convenient access to information. Internet web sites devoted to home composting also serve as important ongoing sources of information. Master composters and other volunteer based activities normally continue throughout the year. These types of programs can also have volunteers visit homes when people have composting problems, to examine bins and determine the nature of the problem and provide composting advice (Kassirer and McKenzie-Mohr 1998; First Consulting Group and Recycling Council of Ontario 1994).

Ongoing support and promotion also includes ways to provide communities with feedback, encouragement and congratulations for participating in a composting program. For example, media stories or newsletters subsequent to a composting event such as a bin sale (see following section on Bin Distribution) can instil civic pride by highlighting progress made to date (e.g. number of new composters, estimated tonnes of organic material diverted from the landfills). Thank-you letters that highlight project and public achievements in waste diversion can be sent to volunteers and residents who participate in surveys or purchase bins during a special promotion (First Consulting Group and Recycling Council of Ontario 1994; Kassirer and McKenzie-Mohr 1998).

#### **2.7.2.3.4 BIN DISTRIBUTION**

Bin distribution has become an important component to home composting programs. These types of programs are implemented to decrease the barrier of having to build or

purchase a compost bin. Municipalities often implement a combination of distribution methods to reach a greater proportion of the population. Bin distribution programs also subsidize the cost of a compost unit through a number of different options. For example, some municipal programs have provided free bins to the public (Markham and Waterloo, Ontario; Gombos 1994; Gies and McGovern 1994; Centre and South Hastings Recycling Board 1994). However most communities offer bins to residents at a reduced price through sale prices or mail-in rebates (Compost Action Project and Resource Conservation Manitoba No date). The price of subsidized bins usually ranges from ten to thirty dollars (approximately one-third to half the normal cost). The cost to the community of providing free bins may be offset through the avoided cost of waste collection and handling yard trimmings.

*Although initially a capital-intensive investment, the subsequent collection, transportation and processing costs for residential organics always exceed the costs of “reduction at source” programming such as free compost bin distribution. Municipalities can justify free bin distribution as a long-term cost-effective solution to potential landfill closures, and tightening budgets (Resource Conservation Manitoba 2003).*

Bin distribution programs also serve as excellent tools for outreach, education and promotion. Larger bin sales where thousands of bins are sold can help to create a higher profile for composting in the community. Bin manufacturers and program administrators often provide bin purchasers with instructional booklets that provide “how to compost” information. Free composting workshops can be offered to bin purchases. Home delivery programs provide an excellent opportunity for a more personal composting demonstration. It is also common to offer subsidized bins only to those individuals that attend a composting workshop. This greatly increases the attendance and ensures each

bin owner has the right information to start composting properly (Woestwin 1996; Woestwin 1998; Block 1998a; Gordon 1998).

Combined with appropriate how-to education and support, bin sales can have a powerful impact on composting and total diversion rates. Reports from years of subsidized composter sales in Portland, Oregon (where over 60,000 composters were sold between 1994-2000) have found that the average bin owner composts 420 kg of organic material annually representing a total diversion of 4.2 tonnes/bin (Foseid 2001). In another example, surveys conducted following an initiative to provide educational workshops and distribute subsidized compost bins to residents in Southern Idaho, USA revealed that approximately fifty percent of respondents (that participated in the program) had begun composting for the first time since attending the program (Morales 1997). Analysis of a free door-to-door composter distribution program in Waterloo, Ontario, showed an estimated participation rate of 79% and potential waste diversion rate of 30% through home composting (Gombos 1992; McKenzie-Mohr and Smith 1999; Birett et al. 2000).

There has been a recent increase in bin distribution programs in Manitoba (RCM 2003). In April of 2001, the City of Brandon initiated a one-day 'Backyard Compost Bin Distribution Blitz' providing over 1100 composters for ten dollars each. Composter usage information showed that over 90% of owners were found to be using their composters (City of Brandon 2003). After nearly a decade since it discontinued its twenty-five dollar composter rebate program, the City of Winnipeg has held two large scale one-day composter sales in June of 2002 and May 2003. During each event over

8,000 composters were distributed to Winnipeg citizens. In one-day truckload bin sales held in the City of Winnipeg in 2002 and 2003, nearly 16,000 individuals purchased composting units. Units were accompanied with an educational booklet, personal advice from volunteers, and the local compost hotline telephone number for future compost queries. Volunteers also signed customers up for free composting workshops. As an increasing amount of bin distribution analysis becomes available, it is becoming more evident that making bins readily accessible to residents is one of the most effective methods of motivating people to compost at home (Johnson 1998).

#### ***2.7.2.3.5 MONITORING PARTICIPATION***

Periodic monitoring and evaluation is another crucial element to successful composting programs. Monitoring is generally conducted through surveys that can be delivered by mail, door-to-door, or by telephone. Including effectiveness evaluation is necessary to measure the extent of participation (i.e. how often or how much is a person composting), public awareness of the program, waste diversion potential of a program, participant satisfaction and if objectives are being met. Incorporating an evaluation component can also help to identify areas that need to be improved and problems participants may be experiencing. For example, while over half (54%) of the respondents interviewed during the City of Winnipeg Composter Survey (PRA 1993) stated that they had no problems composting some common problems were identified including the following.

- 15% felt that the unit was not decomposing material fast enough. Specifically leaves were not composting, the compost pile was not heating up, or the respondent thought that the location was poor.
- Not knowing how to use the compost unit (7%). These respondents said they were not sure of the procedure, what to put in the unit, and how to go about finding out this information.



- 4% had difficulty turning the compost, either because of the weight or because it was difficult to get at. Others stated it was simply difficult to remember to turn the pile.

Identifying these types of problems have helped the Compost Action Project in improving educational and ongoing support methods and in providing answers to common problems and questions. These types of evaluations also allow participants to become more involved in the program by providing feedback and ideas. Communicating results to participants and community members can also serve as positive reinforcement of sustainable behaviour (McKenzie-Mohr and Smith 1999).

### **2.7.3 SUMMARY**

Society generates too much waste for natural ecosystems assimilate. Municipalities are under tremendous strain to manage waste effectively. Current disposal methods that focus on landfilling are also viewed in some of the literature as detrimental to the environment causing negative impacts such as production of toxic leachate, contamination of ground water sources, production of greenhouse gas emissions.

The literature identifies composting as an important element of the waste minimization hierarchy that has the potential to dramatically improve MSWM programs. Composting is described as the human efforts to manipulate the process of decomposition. As such, recovering and processing of discarded organic materials into a soil amendment for other human purposes, has the potential to remove approximately 30-50% of material from the residential waste stream. Composting also provides substantial environmental benefits

including decreasing the impacts of landfills, building healthy soils, resource and energy conservation, as well as reduction in greenhouse gas emissions.

Although large-scale and small-scale municipal composting programs both provide substantial benefits to a community, the literature establishes that decentralized home composting programs are more desirable. Home composting programs offer a low cost, low technology process that is easily managed. They avoid financial, energy and resource requirements, and air emissions normally associated with large-scale programs. There is also substantial evidence that shows decentralized composting programs result in higher potential diversion rates per tax dollar spent. As well, these types of programs also enable individuals to witness the direct results of their efforts providing composters with free fertilizer and allowing residents to take an active role in helping the environment.

A number of key elements were also identified for implementing decentralized home composting programs. The literature revealed that in most cases successful home-composting programs have plans in place for education, promotion, bin distribution and ongoing support. Bin distribution programs in particular have demonstrated their worth in effectively motivating the people to compost by combining education, promotion and providing citizens with the proper tools to start composting immediately. Follow-up surveys have provided important evidence in support of home composting initiatives, along with valuable feedback from the public that helps ensure continuous improvement and high quality programs.

**CHAPTER 3**  
**RESEARCH METHODOLOGY: ASSESSING LOCAL COMPOSTER**  
**DISTRIBUTION PROGRAMS**

**3.1 INTRODUCTION**

The following chapter provides a description of two composter distribution programs, the City of Winnipeg composter sale and the University of Manitoba composter delivery program. Details of each program are provided including background on each sale, and description of the survey approach and data analysis undertaken to evaluate the two programs.

**3.1.1 CITY OF WINNIPEG'S TRUCKLOAD COMPOSTER BIN SALE**

**3.1.1.1 Background on the sale**

The City of Winnipeg offered a one-day composter sale on June 22, 2002. The City contracted Norseman Plastics Limited a company that manufactures plastic home composters called the *Earthmachine*. Norseman has worked with municipalities across North America in delivering large-scale composter sales that are capable of distributing thousands of composters. These sales are also capable of creating a high public profile for composting. This was the first time *Earthmachines* had been offered to Winnipeg residents.

Norseman provides a package deal for municipalities wanting to distribute composters to its residents. This package includes a bulk rate for the composters, promotional tools and advertisements, and coordination and staffing of the truckload bin sale. There were 10,000 *Earthmachine* composters available at four locations (St. James Civic Centre; Garden City Shopping Centre; Kildonan Place Shopping Centre; and St. Vital Centennial Arena).

The retail value of the *Earthmachine* model is approximately \$80.00-\$90.00. During this special promotion customers were able to purchase the *Earthmachine* for \$25.00. Customers also had the opportunity to purchase composting accessories such as aerator/mixing tools and compost accelerator, a nitrogen-based material that is used to speed up the composting process.

In collaboration with the City of Winnipeg, Resource Conservation Manitoba (RCM) coordinated composting information booths at each of the four sales locations. Each booth was staffed with two to three volunteers able to answer basic home composting questions. Volunteers provided bookmarks with the Compost Info line telephone number and signed customers up for future composting workshops. The event resulted in the distribution of over 8000 composters.



**PHOTOGRAPH 3.1 TRUCKLOAD BIN SALE SITE**



**PHOTOGRAPH 3.2 EARTH MACHINE BIN**



**PHOTOGRAPH 3.3 RCM COMPOSTING INFORMATION BOOTH**

## **3.2 UNIVERSITY OF MANITOBA COMPOSTER SALE: EVOLUTION OF A COMPOSTER DELIVERY PROGRAM**

### **3.2.1 BACKGROUND**

The second field component of the research involved developing and piloting a citywide composter distribution program. The purpose was to distribute composters different in design, with different support material, delivered to people's homes for the same subsidized rate of \$25.00 per unit. In order to select a suitable composter, a list of models sold by local distributors was reviewed. Each distributor was contacted to discuss the project, the composters offered and the possibility of purchasing a bulk order at a reduced per unit price. Composter selection criteria table was developed based on selection criteria provided by the Olds College Composting Technology Centre (1996) and utilized to choose the appropriate product for the program. Table 3.1 provides a list of the criteria used and the primary composters assessed during the selection process.

Each composter had its respective advantages and disadvantages, but in the end the unique *Lumberlovers* model with its large capacity, convenient removable front panel and lid, and use of recycled lumber, proved to be the most appropriate composter for the project. In addition to these design advantages, *Lumberlovers* offered a bulk rate of \$50.00/unit (plus GST). Regular price for the bin at the time was \$70.00. Another reason for selecting *Lumberlovers* was the opportunity to provide home delivery service. This is normally offered to customers for a nominal \$5.00 fee. Delivery service was provided to customers within City limits on the condition that the researcher would assume the following responsibilities: take orders, determine location of deliveries, create

delivery schedule, provide physical assistance during delivery; and network with community organizations for further assistance with delivery. Construction of 160 composters began in late August 2002. The last composter was built in early December 2002.

### **3.2.2 PROGRAM COMPONENTS**

One hundred and sixty *Lumberlovers* composters were offered to Winnipeg residences for \$25.00 each (plus GST). Each customer received free delivery and setup, a demonstration of how to use the composter, and a booklet containing composting instruction. Preference was given to households who were not currently composting.

#### **3.2.2.1 Advertising and Promotion**

A number of activities were conducted to promote the program. An advertisement was placed in the *Transcontinental Weeklies* in September and October of 2002. The advertisement included a photograph of the composter, model specifications, description of the project, an appeal to those interested in reducing household waste and contact information to order a bin (telephone, email address). The advertisement is featured in Appendix B. A press release describing the project and its positive impacts to waste diversion was written and emailed to the *Transcontinental Weeklies*, University of Manitoba Student Newspaper and to various email newsgroups and contacts within the community. A display table was set up at University of Manitoba during Waste Reduction Week (October 2003). As well, an unstructured “word of mouth” campaign (simply talking about the sale with family, friends, peers) also contributed to overall sales.

**TABLE 3.1 SELECTION CRITERIA FOR COMPOSTER DELIVERY PROGRAM**

<b>Unit Model Name</b>	<b>Garden Gourmet</b>	<b>Wire Compost Bin</b>	<b>Cedar Compost Bins</b>	<b>Fort Whyte Cedar Compost Bins</b>	<b>Lumberlovers Composters</b>
<b>Local Distributor/ Manufacturer</b>	<b>McDiarmid Lumber; Revy Home &amp; Garden; Canadian Tire:</b> National chains of hardware/garden stores	<b>Lee Valley:</b> National chain of gardening equipment & supplies	<b>Peter Kraemer:</b> one person operation, sells composters as a hobby	<b>Fort Whyte Centre</b> Environmental Education Centre selling bins to fundraise	<b>Lumberlovers Pallet &amp; Wood Recycling:</b> local wood recycling operation
<b>Basic Description</b>	Compact, plastic composter; rectangular shape; airvents, top lid for putting kitchen scraps; sliding bottom door to harvest finished compost; removable lid; Black color to absorb radiant heat for faster decomposition	Metal holding bin; collapsable side panels for easy storage	Cedar wood material; rectangular, box design, sliding bottom door to harvest finished compost, removable lid air vents	Cedar wood material; rectangular, box design, sliding bottom door to harvest finished compost, removable lid air vents	Large composter made from salvaged wood; rectangular, box design; open bottom, removable lid & front panel; Allows for easy access to compost pile for mixing & harvesting
<b>Quality of Materials, Durability</b>	Recycled pvc plastic; thin material that deteriorates in UV radiation and large temperature fluctuations; cold temperatures; expansion, contraction cause material to crack; likely need to be replaced in 6-8 years	Made of heavy-gauge 1/8" steel wire with a polyester powder-coat finish	Virgin cedar wood; strong, durable, high quality material; likely to need replacement in 8-10 years	Virgin cedar wood; strong, durable, high quality material; likely to need replacement in 8-10 years	Mixture of high quality recycled wood (e.g. pine, cedar) strong, durable reinforced design; untreated wood; likely to need replacement in 10-12 years.



**TABLE 3.1 SELECTION CRITERIA FOR COMPOSTER DELIVERY PROGRAM**

<b>Unit Model Name</b>	<b>Garden Gourmet</b>	<b>Wire Compost Bin</b>	<b>Cedar Compost Bins</b>	<b>Fort Whyte Cedar Compost Bins</b>	<b>Lumberlovers Composters</b>
<b>Secure Lid</b>	Includes a dual access/snap shut lid	No; open holding unit	Yes, although not attached to composter	Yes, although not attached to composter	Yes, although not attached to composter
<b>Resistance to Pests</b>	Good resistance to foraging pests	Poor resistance to pests, designed for yard waste	Good resistance to foraging pests	Good resistance to foraging pests	Good resistance to foraging pests
<b>Capacity</b>	Approx. 300 litres; limited capacity especially for yard waste; smaller than RCM recommended size for best results	Approx. 640 litres; designed for yard waste; bin measures 36"X36"X30" high	Approx. 500 litres; larger capacity capable of handling some yard waste; smaller than RCM recommended size for best results	Approx. 500 litres; larger capacity capable of handling some yard waste; smaller than RCM recommended size for best results	Approx. 900 litres; capable of handling large amounts of yard & kitchen waste; minimum recommended volume for best results
<b>Moisture/ Aeration</b>	good moisture retention & aeration, cormers may tend to dry out	Open holding unit; good aeration, should add water to pile to maintain optimum moisture levels	good moisture retention & aeration, cormers may tend to dry out	good moisture retention & aeration, cormers may tend to dry out	good moisture retention & aeration, cormers may tend to dry out
<b>Ease of Assembly</b>	Easy to assemble; instructions included	Easy to assemble; instructions included	No assembly required	No assembly required	No assembly required
<b>Ease of Use/ Access to Material</b>	Easy to add kitchen scraps; small opening - makes it difficult to add yard waste; mixing difficult unless with aerator tool; difficult to access material	Very easy to use; easy to add and turn material; easy access to material; corner rods pull-out to make pile accessible	Very easy to use; easy to add material; mixing difficult unless with aerator tool; limited access to harvest compost material	Very easy to use; easy to add material; mixing difficult unless with aerator tool; limited access to harvest compost material	Very easy to use; easy to add material; easier to access and tend to compost pile; panel/lid sometimes stick making it difficult to open; material may tend to spill out of box when turning

**TABLE 3.1 SELECTION CRITERIA FOR COMPOSTER DELIVERY PROGRAM**

<b>Unit Model Name</b>	<b>Garden Gourmet</b>	<b>Wire Compost Bin</b>	<b>Cedar Compost Bins</b>	<b>Fort Whyte Cedar Compost Bins</b>	<b>Lumberlovers Composters</b>
<b>Track Record/ Customer Feedback</b>	Mixed track record from local customer feedback	unknown	unknown	unknown	Manufacturer had mixed track record and reputation; customers gave positive feedback on bins
<b>Support Material</b>	Includes "Home Composting Made Easy" manual	None	None	Fort Whyte compost educational material	None
<b>Aesthetics</b>	Attractive design	Attractive design	Attractive design	Attractive design	Design more practical; depends on condition of wood selected; can vary from bins
<b>Transport</b>	Easy to transport box in any vehicle; customer would pick up	Easy to transport with vehicle; customer would pick up	Easy to transport with vehicle; customer would pick up	Easy to transport with vehicle; customer would pick up	Difficult to transport; customer would require a pickup truck or delivery of bin; weighs 80-100 lbs
<b>Retail Price</b>	\$39.99; willing to negotiate	\$29.50; willing to negotiate; Economically priced	\$89.00; over price range; wouldn't be feasible to sell at a lower price	\$60.00 without lid; \$90.00 with lid; Fort Whyte contact was able to get a low cost for mfg bins but wanted to mark up the price to raise funds for the centre; final asking price over price range	\$75.00; Willing to negotiate to \$50.00 plus tax; plus a nominal fee for delivery of bins

**TABLE 3.1 SELECTION CRITERIA FOR COMPOSTER DELIVERY PROGRAM**

<b>Unit Model Name</b>	<b>Garden Gourmet</b>	<b>Wire Compost Bin</b>	<b>Cedar Compost Bins</b>	<b>Fort Whyte Cedar Compost Bins</b>	<b>Lumberlovers Composters</b>
<b>Delivery Time/ Availability/ Storage</b>	Allow 7-10 days; available in large quantities; need to store at retailer; need to design a coupon/voucher system for subsidy recipients	Allow 7-10 days; available in large quantities; need to store at retailer; need to design a coupon/voucher system for subsidy recipients	Unknown, very small operation that has never produced that many bins	Allow 1-2 months for composters to be built; composters would be sold from Fort Whyte	Allow 1-2months for composters to be built; small operation with ltd staff & resources; bins to be delivered to households as they are finished being constructed
<b>Creates Local Jobs</b>	Revenue earned by national chain retailer, product not manufactured locally	Revenue earned by national chain retailer, product not manufactured locally	Small local business; employs local manufacturer	Employs inmates; moral debate on using cheap inmate labour to produce bins, taking jobs away from citizens	Small local business, employs local manufacturer
<b>Local Waste Diversion Potential</b>	Uses recycled material; product itself not diverting local waste; generates waste from packaging; small capacity limits household waste diversion to mostly food wastes & small amounts of yard waste; single composter suitable for small family that does not generate much organic waste	Product itself not diverting local waste; larger capacity for diverting yard waste; good potential for household to divert food wastes if undeterred by having pile unprotected	Product itself not diverting local waste; larger capacity for diverting both yard waste & food waste	Product itself not diverting local waste; larger capacity for diverting both yard waste and food waste	Uses recycled material found locally that otherwise would get sent to the landfill; Each bin diverts nearly 100 lbs of wood waste; No waste from packaging; larger capacity for household diversion of food and yard wastes
<b>Other Factors</b>			Cedar wood is said to contain chemical preservatives that hinder the composting process	Cedar wood is said to contain chemical preservatives that hinder the composting process	

### **3.2.2.2 Composting Brochure**

In light of the findings in the literature review, providing proper “how-to” compost education and reference material was viewed crucial to the success of the program. *Lumberlovers* composter did not initially come with instructions on how to compost. Hence, a composting information booklet for each customer was discussed with the Compost Action Project (CAP). CAP agreed to release electronic copies of their composting information pamphlets. This material would be used to formulate the information booklet that would accompany each composter.

The final booklet included instruction on how to compost, what materials were to be composted, tips on year-round composting, and how to avoid pests. The Compost Info-line telephone number was placed on the front of each booklet in case questions came up in the future. The cover page and table of contents from the booklet is featured in Appendix E.

### **3.2.2.3 Taking Orders and Pre-Purchase Questions**

Orders were accepted by telephone, email and at the University of Manitoba display table. Pre-purchase questions were asked to screen customers to focus on single-family dwellings and maximize the number of participants who were not currently composting. Microsoft Excel spreadsheets were used to enter personal data such as name, address, telephone number, and area of the City. Qualitative information regarding the household level of composting experience (e.g. no previous composting experience, prior composting experience in another house or currently composting), and general points of

discussion were also entered into the spreadsheet. Each customer was told that a follow up call would be issued to schedule the delivery. As well, to receive the discount each customer would have to agree to complete a follow-up survey in the near future (although in reality no enforcement of this rule would actually take place and customers would be free to decline).

#### **3.2.2.4 Deliveries and Demonstrations**

In total, 100 composters were distributed from September 22, 2002 to the January 8, 2003. Each customer address was located on a map. A schedule was developed, minimizing travel time by grouping customers in close proximity of each other. Once schedules were developed, customers were contacted and delivery day was confirmed. Seventy-six deliveries were made using an S-10 truck and trailer. Shaun Murphy, *Lumberlovers'* sole proprietor and designer of the wood bins also aided in the delivery. Mr. Murphy delivered ten bins alone and sixty-six with the researcher's assistance. The researcher delivered seventy-eight composters in a half-ton truck with a cab. Three more were delivered in a passenger van with staff from the Winnipeg Boys and Girls Club. The remaining three customers were asked to pick up their composters because they lived outside of City limits. Payment was made at the time of delivery.

During deliveries a mobile telephone was used to contact customers to ensure they were home before arriving at the house. Each composter was placed in appropriate locations in the yard. The demonstration involved instructions on how to use the bin, providing tips on how to get started, and answering questions. Important sections in the booklet

and the RCM Compost Information Line number were emphasized during the demonstration. Each customer was also told to expect a follow up call in the next couple of months. The length of each delivery averaged about thirty minutes to one hour depending on the difficulty of locating the house, transporting the composter into yards with awkward entrances, and the amount of time spent discussing composting.

### **3.3 CUSTOMER SURVEYS: FOLLOW-UP ANALYSIS FOR COMPOSTER DISTRIBUTION PROGRAMS**

A key component of the study was developing and conducting surveys to evaluate and analyze the impact of each distribution program. Two customer surveys were developed in consultation from the thesis advisory committee. The overall purpose of the surveys was to evaluate the impacts of each sale in terms of increasing the number of households composting in Winnipeg. Objectives of the surveys were:

- To determine personal motivations for purchasing a composter;
- To identify the percentage of households that were composting prior to purchasing a composter and the percentage of new composting households;
- To determine if customers had started to use their composter and if not why;
- To identify problem areas with customers and their composting experience;
- To identify areas of improvement with each distribution program and composter;
- To determine attitudes of customers towards home composting;
- To determine to what extent the availability of the subsidized composter affected the resident's decision to purchase the composter; and
- To provide a list of recommendations for future composting initiatives.

### **3.3.1 CITY OF WINNIPEG CUSTOMER SURVEY**

The City of Winnipeg Water and Waste Department provided a Microsoft Excel spreadsheet containing contact information of customers. During the City bin sale, customers were asked to fill out registration cards prior to purchasing a bin. After “cleaning up” the data (removing customer names without contact information), the spreadsheet of customer information formed the population frame of 6084 that was used to randomly select customers for the survey.

#### **3.3.1.1 Determining Sample Size**

To establish a significant sample size for the survey, a pilot study was conducted. The pilot study served two purposes. Its primary purpose was to estimate the parameters necessary for the sample size calculations. Second, it was used to ensure that the survey met the purposes of the research with responses that were clear and to the point.

Once the Advisory Committee approved a final draft, surveys were tested in December of 2002 with a random selection of twelve customers. Microsoft Excel was used to generate a series of random numbers between one and 6084. These numbers were then used to select customer names from the customer list by matching the generated number with the corresponding customer number. Any duplicate numbers generated in the series were discarded. In total, five customers filled out test versions of the survey. Adjustments to the questionnaire and survey techniques were made according to the suggestions of the committee and the problems experienced during the test run.

Surveys were sent to a random sample of fifty-two customers in March 2003. A total of twenty-six surveys were returned and the data from the completed surveys was entered into a spreadsheet. After the data was sorted a set of ‘objective questions’ were established. The objective questions are those the researcher is most interested in answering. From these questions a sample mean and variance were estimated. Since there was no population mean and variance at the start of the project, it was necessary to estimate these values for the sample size. Using these objective questions a sample size was calculated for each question using the following formula:

Three recommended sample sizes were determined using the following statistical formula:

$$n = \left( \frac{z^* \hat{p}\hat{q}}{m} \right)^2$$

Where:

**n** = sample size

**z\*** = level of significance (1.96) (95% level)

**m** = margin of error (how accurate we want to be based on the variability of the estimate)  
= 0.04 an arbitrarily chosen number.

**p (hat)** = portion of response (changes for each question) = x/n, x represents the number of people who responded to the question favourable and n represents the number of people who responded to the question

**q (hat)** = 1-p (hat) = 1-x/n is a calculated value found after p (hat) is calculated.

**(p(hat) looks at the favourable responses and q(hat) looks at the unfavourable responses.)**



Table 3.2 shows the four objective questions used. Two sample sizes using two different margins of errors were calculated based on these four questions we calculated. A margin of error of 0.04 was used due to resource and financial limitations of the project. During the sampling procedure, once a person/household was selected to take part in the survey their name was removed from the population to avoid duplicates. After the calculations were completed, the following sample sizes were considered:

<b>Recommended Sample Sizes</b>	<b>% OF POPULATION</b>
$n_1 = 361$	$361/6084 = 5.9\%$
$n_2 = 466$	$466/6084 = 7.6\%$
$n_3 = 546$	$546/6084 = 9.0\%$

The smallest sample size was chosen on the basis of time and money constraints. In the end, combined with the initial fifty-two surveys, a total of 361 surveys were mailed out to customers or 5.9% of the customer population was surveyed. Out of 361, 193 surveys were completed and returned.

**TABLE 3.2 STATISTICS FOR OBJECTIVE QUESTIONS SELECTED**

<b><math>(z=1.96/m=0.04)^2</math></b>	<b><math>p(\hat{h})</math></b>	<b><math>q(\hat{h})</math></b>	<b><math>n(\text{not})</math></b>	<b><math>n\text{- using correction factor}</math></b>	<b>Question</b>
2401	0.40	0.60	576	526	Question 1
2401	0.20	0.80	384	361	Question 1
2401	0.50	0.50	600	546	Question 1
2401	0.70	0.30	504	466	Question 5
2401	0.80	0.20	384	361	Question 5
2401	0.30	0.70	504	466	Question 4
2401	0.40	0.60	576	526	Question 4
2401	0.70	0.30	504	466	Question 7
2401	0.60	0.40	576	526	Question 7
<b><math>(z=1.96/m=0.02)^2</math></b>	<b><math>p(\hat{h})</math></b>	<b><math>q(\hat{h})</math></b>	<b><math>n(\text{not})</math></b>	<b><math>n\text{- using correction factor}</math></b>	<b>Question</b>
9604	0.40	0.60	2305	1672	Question 1
9604	0.20	0.80	1537	1227	Question 1
9604	0.50	0.50	2401	1722	Question 1
9604	0.70	0.30	2017	1515	Question 5
9604	0.80	0.20	1537	1227	Question 5
9604	0.30	0.70	2017	1515	Question 4
9604	0.40	0.60	2305	1672	Question 4
9604	0.70	0.30	2017	1515	Question 7
9604	0.60	0.40	2305	1672	Question 7

### 3.3.1.2 Survey Packages

Each survey package included a ten-page questionnaire consisting of twenty-four questions (primarily close-ended with room for additional comments), a cover letter and a stamped return-addressed envelope. The cover letter provided details of the study, contact information for questions and instructions to fill out the survey within a two week time period. A copy of the cover letter and the questionnaires are provided in Appendix E, F and G. Survey packages were mailed to the sample of customers on April 10, 2003. An additional letter was sent on May 9, 2003 to 210 households to remind these customers to fill out the survey. A copy of the letter is included in Appendix H.

### **3.3.1.3 Sampling Bias**

One can argue that the study considered those individuals that have purchased a composter and already exhibited the motivation to start composting. Thus the survey is not a reflection of the general population but more of a representation of two population segments referred to by RCM (2001) as avid/dedicated composters – the easiest segment of the population to persuade to compost (approximately 20% of the population), and borderline composters, which comprises 60% of the general population who have barriers that have prevented them from starting to compost. With a greater amount of time and resources, further research could have been conducted involving a control group of individuals from the general population, which could include non composting households and households that are composting without a City of Winnipeg composter much like the survey conducted by PRA (1993).

### **3.3.1.4 Response Rate**

In total, 188 households responded to the mail out survey or 52% response rate. In terms of the non-response rate, 172 customers did not respond or 48% of the sample. Of these, seventeen surveys (5%) were returned because the mailing address was incorrect or the person contacted had moved. This leads one to believe that more surveys did not reach the desired recipient because of a change in address, human error in mailing out letters or incorrect addresses given during the sale. Data from the 188 returned surveys were combined with the results of the five returned piloted surveys, for a total of 193 surveys.

### **3.3.1.5 Data Collection and Analysis**

Each returned survey was reviewed and data entered into Microsoft Excel spreadsheets.

Data included quantitative and written responses regarding:

- Reasons for purchasing a composter,
- Previous composting households,
- Number of households that have started to use the composter,
- Materials composted,
- Problems experienced with composting,
- Attitudes towards composting;
- Level of satisfaction and general opinions about the program, the composter and their composting experience.

Microsoft Excel was used to calculate results, generate graphs and interpret the data. Statistical Chi-Square Tests were used to determine if responses to questions #4, #10 and #17 were significantly different between previous composters and new composting households.

### **3.3.2 FOLLOW-UP SURVEYS FOR COMPOSTER DELIVERY PROGRAM**

Follow-up surveys were conducted with customers that received a *Lumberlovers* composter. A test version of the survey was given and completed by two customers in November 2002. Based on the responses, it was decided that the survey be administered in the spring focusing on the customers that received their composter before the winter months. Two approaches, a mail-out survey and home visits, were used to collect data and customer feedback.

An initial mail-out survey was sent on April 14, 2003 to the first twenty customers that received a composter. Survey packages included the questionnaire, an introduction letter

explaining the purpose of the study and providing contact information for the researcher and the University of Manitoba Research Ethics Board, and an addressed, stamped envelope for the respondent to return the survey. Fifteen out of the first twenty replied without follow up. A follow up call was administered to the five remaining subjects. However, only one out of the five was reached. This individual had lost the original and asked for an emailed copy to fill out.

A separate group of customers was contacted to conduct home visits. These visits were conducted from April 15 to May 7, 2003. Customers were contacted by telephone and asked if they were using their composter. Those that were composting were asked to schedule an appointment to do a follow-up survey. A total of twenty home visits were conducted. Visits consisted of having hard copies of the survey filled out by the customer, examining the composter to see if it was in use and gauging the amount of material that was being composted. General discussion regarding the composter, the program, and overall experience with composting was encouraged and notes recorded by hand. The length of each visit ranged from thirty minutes to an hour. An additional fourteen surveys were mailed out to those that declined a visit, were not composting, or were not home when telephoned. Seven of these customers returned their survey. Another customer asked for an emailed copy of the survey and returned it immediately. A total of forty-five out of fifty-five customers contacted completed a survey for a response rate of 82%.

### **3.3.2.1 Data Collection and Analysis**

Microsoft Excel was used to enter data from returned survey and notes from the customer visits, and to calculate response percentages. Data was analyzed for the following information:

- Reasons for purchasing a composter,
- Previous composting households,
- Number of households that have started to use the composter,
- Materials composted,
- Problems experienced with composting,
- Attitudes towards composting;
- Level of satisfaction and general opinions about the program, the composter and their composting experience.

### **3.3.2.2 Estimating Waste Diversion Potential**

The potential waste diversion impacts from the distributed bins were estimated for each case study. Waste diversion potential was estimated through the use of a formula described by Bagby (2000). The data required to track measurement of the bin sale are:

- Number of Bins Distributed (NBD);
- Usage Rate of Bins (UR);
- Yard Waste & Food Waste Generated (YWG + FWG);
- Compostable Fraction (CF); and
- Composter Efficiency Rate (ER).

UR is the percent of bins that are actually being used. This data was collected through the follow-up surveys. One must however take into account that the UR from surveys conducted during this study are short-term. Bagby (2000) suggests that municipalities can expect 70% long-term bin usage rates following a large-scale bin distribution

program. YWG and FWG is an estimate of how much yard and food waste is generated per household before any reduction or composting activities. This data can be located in the Winnipeg waste composition statistics found in Table 3.4. CF is an estimate of what percentage of yard waste and food waste is compostable in a backyard bin. ER is an estimate of what percentage of CF residents will actually put in their bin.

**TABLE 3.3 WINNIPEG WASTE COMPOSITION STATISTICS**

	<b>PER CAPITA WEIGHTED AVERAGE FOOD WASTE (KG)</b>	<b>COMPOSTABLE FRACTION OF FOOD WASTE</b>
<b>TOTAL</b>	68.9	= FRUIT & VEGETABLE WASTE/TOTAL FOOD WASTE*100 = 41.7/68.9*100 = 60.5%
	<b>PER CAPITA WEIGHTED AVERAGE OF YARD WASTE (KG)</b>	<b>COMPOSTABLE FRACTION OF YARD WASTE</b>
<b>TOTAL</b>	11.4	= GRASS & LEAVES/TOTAL YARD WASTE * 100 = 9.6/11.4*100 = 84.5%

*Source: Earthbound Environmental 2000*

The data is entered into the following formula is used to estimate the waste reduction potential:  $NBD \times UR \times (YWG + FWG) \times CF \times ER = \text{Waste Diverted}$ . A range of potential waste reduction estimates for this study is calculated by selecting high-end to low-end values for the UR and ER variables. The data is entered into the following formula is used to estimate the waste reduction potential:  $\text{Number of Bins Distributed (NBD)} \times \text{Usage Rate of Bins (UR)} \times \text{Per Capita Yard + Food Waste Generated (YWG + FWG)} \times \text{Compostable Fraction (CF)} \times \text{Efficiency Rate (ER)} = \text{Waste Diverted}$ . A range of potential waste reduction estimates for this study is calculated by selecting high-end to low-end values for the UR and ER variables.





## **CHAPTER 4 CITY OF WINNIPEG TRUCKLOAD BIN SALE SURVEY: SUMMARY OF RESULTS AND FINDINGS**

### **4.1 INTRODUCTION**

As outlined earlier in the previous chapter, one of the key objectives of the research was to analyze the impacts of the City's truckload bin sale. This Chapter, thus, provides a summary of the main findings from the City of Winnipeg truckload bin sale survey of customers and the significant themes uncovered from the data analysis. The main topics discussed in the chapter include: the ratio of previous and new composting households; factors that influenced customers to purchase a composter; feedback regarding household composting experience; customer satisfaction level with truckload bin sale components; and the significance of the bin subsidy. Key findings include the high proportion of households that were not composting prior to the sale; important reasons for purchasing a bin; respondent bin usage rates; and the respondent satisfaction rate of the *Earthmachine* and the distribution techniques. The Chapter concludes with a discussion on the main findings, limitations of the survey, and opportunities for further home composting initiatives and research in Winnipeg.

### **4.2 PARTICIPANTS SPEAK: RESULTS FROM CUSTOMER SURVEYS**

Follow-up surveys were administered approximately a year after the bins were delivered to evaluate the impacts of the bin delivery program. The main goal was to see how effective the combination of tools including: promotion, advertisements, reduced bin prices, and information handouts were in persuading participants to start composting.

#### **4.2.1 RATIO OF EXPERIENCED TO INEXPERIENCED HOUSEHOLDS**

The survey was used to estimate the level of composting experience customers had prior to purchasing a bin. It was assumed that those with little or no composting experience would require more instruction and support versus a person that has been composting successfully for years. The results of the survey revealed that sixty percent of respondents were inexperienced composters, not composting (at current place of residence) prior to the sale.

#### **4.2.2 SEVERAL IMPORTANT REASONS FOR PURCHASING A COMPOSTER**

The literature review identified a variety of factors that were important in influencing composting behaviour and in distinguishing between composting and non-composting households. One of the primary objectives of the survey was to identify common reasons/motivations that customers had for purchasing a composter and participating in the program. Table 4.1 illustrates the quantitative data from question number four and indicates the significance of the following factors: reduction of household waste; satisfaction from helping the environment; producing finished compost for home use; saving money on store bought fertilizers; being encouraged by family or peers; access to composting information; bin sale made it affordable to purchase a composter; and customer has wanted to start composting for years and the sale was a good incentive to start. The highest percentage of responses is highlighted in bold. The following sections discuss these factors and also incorporate additional factors revealed by respondents.

**TABLE 4.1 REASONS FOR PURCHASING A  
COMPOSTER (% OF RESPONSES)**

<b>FACTORS</b>	<b>NAAI</b>	<b>SI</b>	<b>N</b>	<b>I</b>	<b>VI</b>	<b>DK</b>	<b>NA</b>
<b>Reduce Household Waste Satisfaction from Helping Environment</b>	1.6	4.7	5.2	26.4	<b>58.6</b>	0.0	3.6
<b>Producing Compost</b>	0.0	9.3	7.8	34.7	<b>44.6</b>	0.0	3.6
<b>Saving Money on Fertilizers</b>	14.0	15.5	<b>25.4</b>	21.8	19.2	0.5	3.6
<b>Encouraged by Someone</b>	<b>35.8</b>	9.3	25.9	13.5	5.2	3.1	7.3
<b>Access to Composting Information</b>	15.0	15.5	22.3	<b>24.9</b>	13.0	2.6	6.7
<b>Sale Made It Affordable to Purchase Composter</b>	2.6	5.7	9.3	32.6	<b>45.1</b>	0.5	4.2
<b>Wanted to Start Composting - Sale - Good Incentive</b>	16.1	6.7	10.4	26.9	<b>35.8</b>	0.0	4.2

NAAI – Not at all Important; SI – Somewhat Important; N – Neutral; VI – Very Important; DK – Don’t Know

**4.2.2.1 Environmental Benefits of Composting/Personal Satisfaction of Helping the Environment**

Environmental benefits from home composting were important reasons for respondents’ decision to purchase a composter. Figure 4.1 shows that reducing household waste, feelings of satisfaction from helping the environment and producing compost for home use were seen as “very important” or “important” by more than 80% of respondents in their decision to purchase a composter. Respondents provided comments, which also reflected the significance of associated environmental benefits and a customer’s desire to help the environment. At least ten respondents provided written comments indicating that benefits such as: “helping the environment”; “reducing waste”; and “improving soil conditions” were very important factors in their decision to purchase a composter. “Taking responsibility for the wastes produced and turning it into something beneficial,”

were the words from one respondent. Another respondent also made reference to composting and its impact on climate change and greenhouse gas emission reduction.

#### **4.2.2.2 Affordable Price of the Composter**

Respondents also indicated that the reduced price motivated them to purchase a composter. Table 4.1 shows that nearly 80% of the respondents felt it was “very important” to “important” that the bin sale made the *Earthmachine* affordable. Table 4.1 also shows that approximately 63% of the respondents answered “very important” or “important” to the statement “We have wanted to compost for a while and the bin sale provided a meaningful incentive to start.” For those that were composting previously, the sale provided an excellent incentive to purchase another composter to increase the amount they were composting or replace/upgrade their current composting system. One responded wrote, “We have composted for a while and the bin sale provided a meaningful incentive to buy another one”, indicating that even experienced composters will purchase another composter if the price is right.

#### **4.2.2.3 Need for Another Composter**

With over 40% of respondents composting prior to the City’s sale, the desire to purchase an additional composter was an important reason particularly for City of Winnipeg respondents. The most common theme amongst these respondents was the desire to compost more of their household organic waste. For many their current composting systems were not able to accommodate all their waste organics. For example, one respondent commented “too many leaves and lawn clippings for current composter” as a

motivating factor. Additional composters were also purchased by some respondents to replace old units or upgrade current composting systems.

#### **4.2.2.4 Convenience**

As highlighted by McKenzie-Mohr & Smith (1999), there are two aspects of convenience related to composting: convenience of carrying out composting tasks, and the convenience of obtaining a composter. The quality, type and features of a composting system that a household uses are directly linked to the convenience of carrying out composting related tasks. Nearly 24% of respondents that provided written responses stated that the design of the *Earthmachine* model influenced their decision to purchase a composter. Respondents made positive references of the model in terms of its convenience of use, ease of assembly, large size, secure lid, protection against rodents, and aesthetic quality. One respondent also commented that the unit “made compost collection in winter more convenient”.

As these types of large-scale bin sales are aimed to increase the convenience of obtaining a composter, it is somewhat surprising that only one person made reference to the convenience of obtaining a bin, noting the convenient location of the sale, as a motivating factor for her to purchase a composter. Many respondents perceived standing in line for long durations as inconvenient, an issue discussed further in this chapter.

#### **4.2.2.5 Purchasing a Composter for Someone Else**

Purchasing a composter for friends or family was another reason provided by respondents. With the City of Winnipeg sale there were seven respondents that claimed to have purchased a composter for friends and family. One woman claimed to have purchased three *Earthmachine* composters, “to give one to each of my three children who have their own home”. Other customers had purchased units for friends or family that lived out of town or could not make it to the sale at the time.

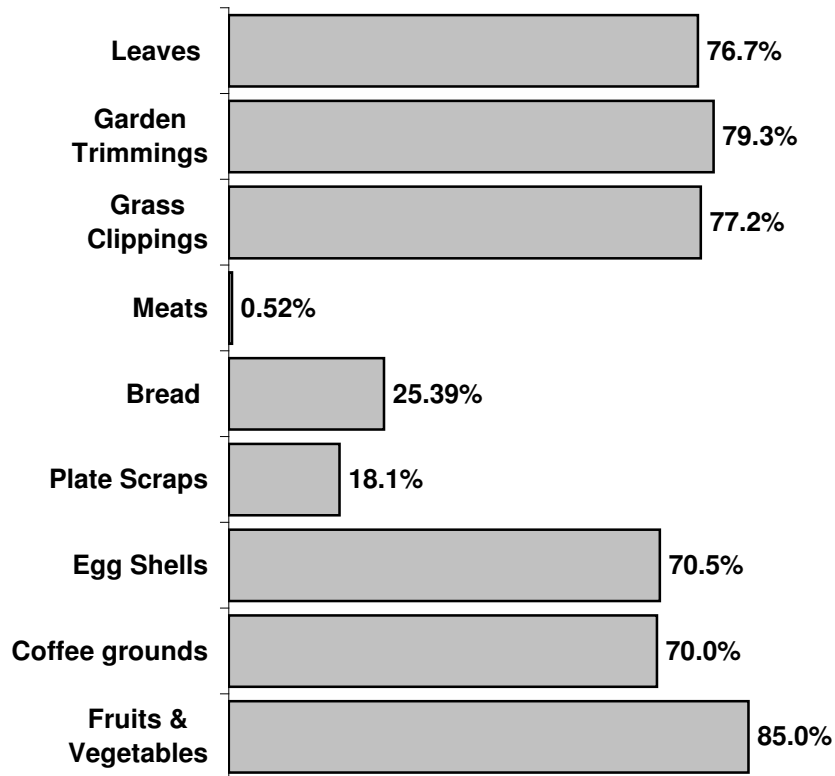
#### **4.2.2.6 Economic Benefits of Composting**

The primary economic benefit referred to in the survey was “saving money on store bought fertilizers”. The results indicated that saving money on store bought fertilizers was not a major factor in deciding to purchase a composter or for respondents to start composting. Direct savings from practicing composting did not appear to be a significant motivating factor for respondents.

### **4.2.3 MAJORITY OF RESPONDENTS HAVE STARTED TO USE THEIR EARTHACHINE COMPOSTER**

The results of the survey revealed that a majority of respondents have started to use their City of Winnipeg composter within a year of purchasing their bins. Of the 193 customers that responded to the survey, 170 or 88% claimed to have started to use their composter. Of the twenty-three that had not started to use their *Earthmachine*, ten were beginners and nine had previous composting experience. (Note: four respondents did not provide information on their level of composting experience.

As illustrated in Figure 4.1, most respondents were found to be composting both kitchen and yard waste. Fruit and vegetable scraps were the most common material composted (85%) by respondents. Approximately 80% of respondents also said they were composting various forms of yard waste including: leaves (76.7%); garden trimmings (79.3%); and grass clippings (77.2%). Other materials composted by respondents included coffee grounds (70.5%) and eggshells (70.5%).



**FIGURE 4.1 PERCENTAGE OF ORGANIC MATERIALS COMPOSTED BY RESPONDENTS**

Non-composting households gave a variety of reasons for not using their *Earthmachine* composter. Many had yet to assemble and position the composter in the yard because they had just moved, were trying to decide where to put it in the yard, were in the middle

of landscaping and/or backyard construction, or they simply had not found the time to get started. Other factors that prevented respondents from starting to use their composter included lack of knowledge of how to compost properly, negative perceptions about composting and complaints about the unit design.

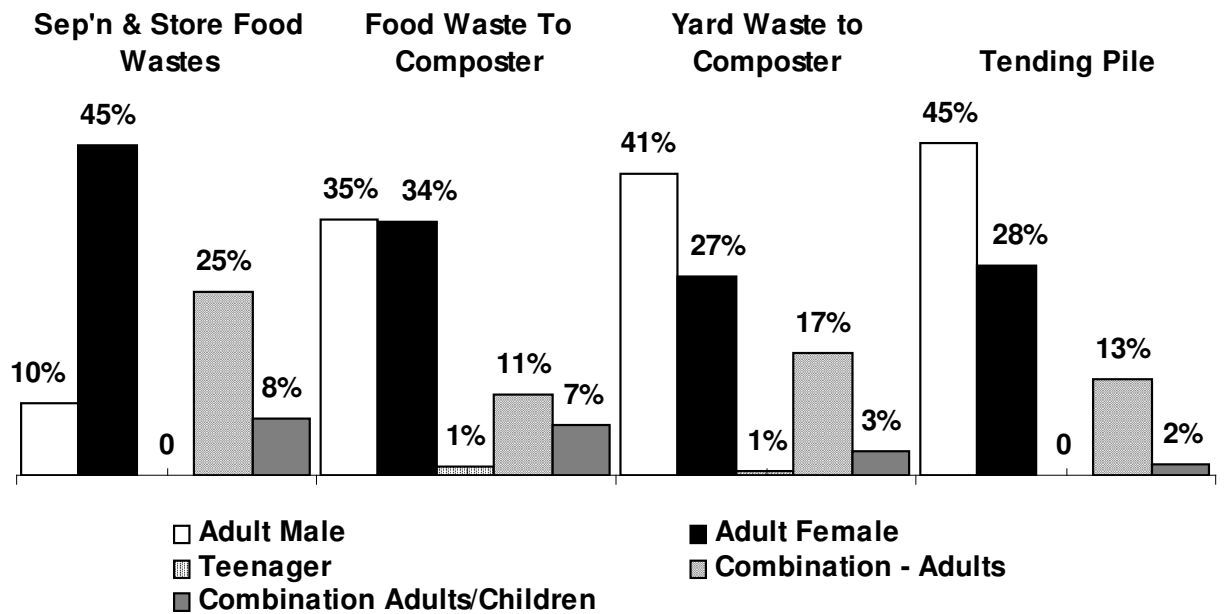
These deterrents prevailed despite providing each customer with a composting booklet, having volunteers to answer questions during the sale, and providing the Compost Info-line telephone number. One respondent admitted that she needed to read more about composting to get started. Another respondent commented that she was scared that she would have a “stinking pile of yuck beside the porch”. Other respondents expressed fears of attracting insects and rodents while also being unhappy with the “awkward construction of the bin that easily comes apart”. There were respondents that only purchased a bin for a friend or relative, while another admitted to having sold his composter to a friend because he felt he did not need it. Despite these barriers, the high percentage of composters in use is encouraging. As well, sixteen out of the twenty-three that were not using their composter said they would eventually start using it the following spring, or when they had found room in the yard to set the composter up and start composting.

#### **4.2.4 COMPOSTING DUTIES**

Figures 4.2 and 4.3 show that adults in the household generally share composting duties with limited involvement from children. The adult female of the household was more often responsible for separating and storing kitchen waste. There was a split with adults



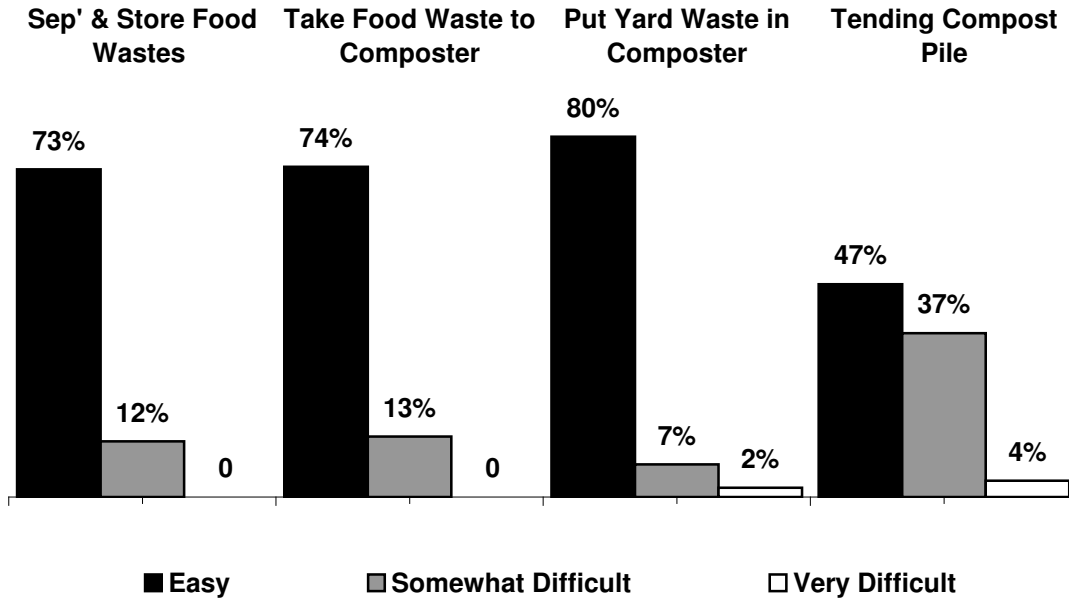
having the responsibility of taking kitchen waste to the composter. Meanwhile, the adult male was more likely to be responsible for adding yard waste and tending to the compost pile. There were also many cases in which each task was shared between both adults in the household. The results from the inquiries about composting duties were similar to the findings of past home composting studies (Maclaren 1990; Prairie Research Associates 1993).



**FIGURE 4.2 DISTRIBUTIONS OF COMPOSTING RESPONSIBILITIES AMONG HOUSEHOLD MEMBERS**

As shown in Figure 4.2, “tending the compost pile” was found to be the most difficult task for users. Nearly 40% of the respondents experienced some difficulty in maintaining their compost piles. Many respondents that found this task to be difficult admitted that they had yet to mix, water, or harvest finished compost at the time of the survey, nearly a year after purchasing their bin. *Earthmachine* respondents also admitted to having

difficulties turning the pile due to the design, the bin being full, winter freezing and having physical disabilities.



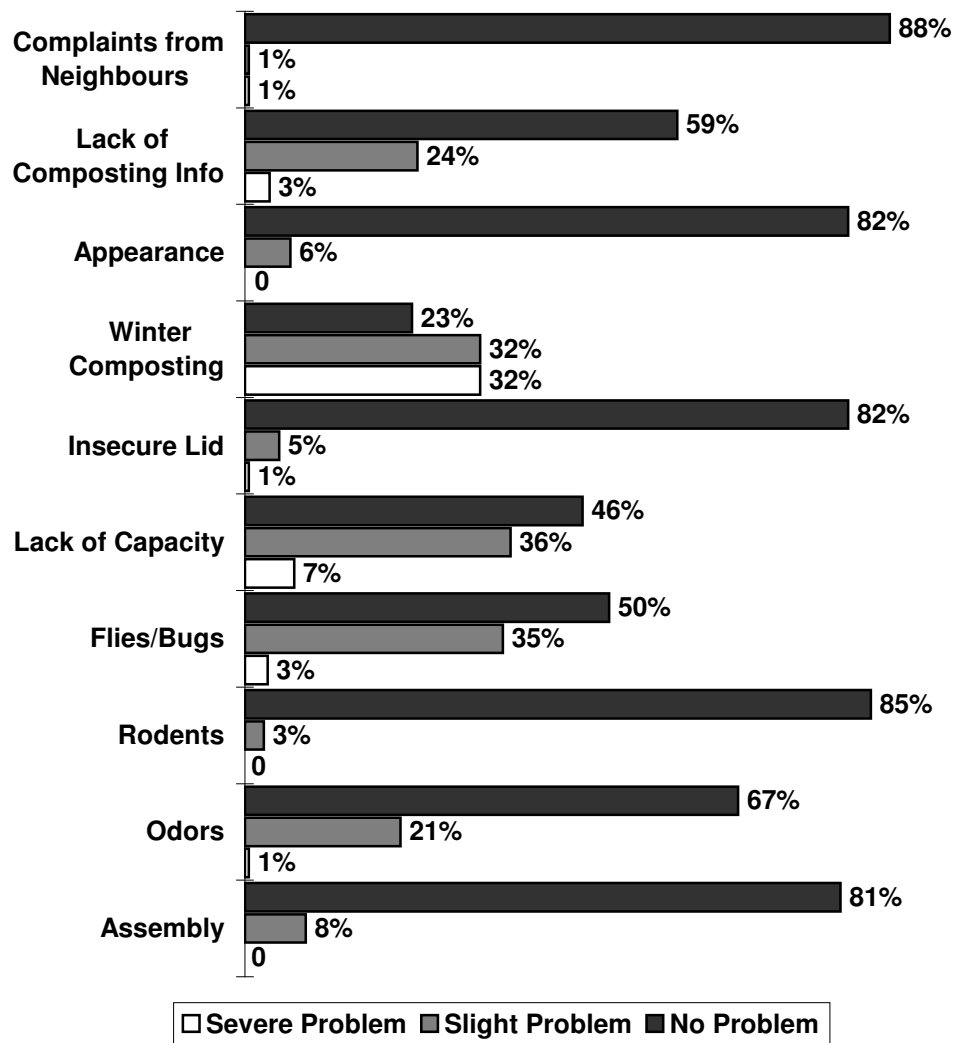
**FIGURE 4.3 LEVEL OF DIFFICULTY FOR COMPOSTING TASKS**

Few respondents had difficulty with other composting tasks. However, those that found taking kitchen scraps to the composter “somewhat difficult”, commented on the location of the composter, the winter, and the location of the composter during the winter, as strong deterrents to bringing kitchen scraps to the composter. Respondents provided several references to “kitchen catcher pails” that have lids and how they make the task of taking kitchen scraps to the composter more convenient.

#### **4.2.5 COMPOSTING PROBLEMS EXPERIENCED BY RESPONDENTS**

As shown in Figure 4.4, respondents generally experienced few serious problems during the first year of using their *Earthmachine* composter. Over 80% of those surveyed

experienced “no problems” with the following: complaints from neighbours (88%); appearance of composter (82%), insecure lid (82%); rodents (85%); or assembly (81%). Respondents did experience some issues with “lack of composting information” (27%- Slight to Severe Problem; 59% No Problem); and “odours” (22% - Slight to Severe Problem; 67% - No Problem).



**FIGURE 4.4 PERCENTAGES OF RESPONSES REGARDING PROBLEMS**

Respondents cited “lack of capacity” and “winter composting” as the biggest problems experienced. Approximately 42% of customers surveyed experienced slight to severe problems related to a lack of bin capacity. This is discussed further in the *Earthmachine* evaluation section. Winter composting caused the most serious problems, which is not surprising as the frigid Winnipeg winters are likely to deter even highly motivated households from making the trudge through snow-filled backyards to throw out kitchen scraps. With *Earthmachine* customers, over 60% of the respondents had a slight or severe problem composting during the winter. Problems experienced during the winter include: having the lid freeze shut, having the composter in the yard and not wanting to walk through the snow, and the bin filling up too quickly due to the lack of biological activity during cold weather. These problems caused several of the respondents to cease composting during the winter months.

Chi-squared statistical analysis revealed a significant difference between customers with previous composting experience and new composting households. Previous composters were more likely not to experience severe problems with winter composting using simple techniques to address winter composting challenges. During the winter, kitchen wastes can be stored in an alternate container (such as a garbage can), positioned in a convenient location near the house. This container can be emptied into the composter during the spring, with available bulking agents (leaves, dried grass clippings). Here is the response from one experienced composter that had solved her winter composting woes,

*The unit is at the back of our lot and often was snowed in. I simply put wastes in small plastic bag, secured it and stored it in empty garbage bins. In the spring we opened the bags and layered the scraps with stored, dried leaves.*

This is a relatively simple solution that households new to composting may not be aware of. According to respondents, the most common solution to the lack of capacity was to build or purchase an additional composter, limit the amount of yard waste being put in composter, and turning the pile. Some respondents did mention that having a larger bin would help solve capacity problems. Solutions to flies, bugs and odours were similar and included adding soil, peat moss, grass or newspaper to cover the pile, and turning the pile.

Despite problems experienced, only 10% of surveyed customers stopped using their composter. In all these cases, the stoppage was temporary. For example, those respondents that experienced severe problems with winter composting, decided to stop composting during the winter months. Lack of capacity for grass clippings and leaves, and a fruit fly infestation were also cited as problems that caused householders to temporarily stop composting until problems subsided.

#### **4.2.6 EVALUATING CUSTOMER SATISFACTION WITH BIN SALE PROGRAM**

A series of questions was included in the survey to help evaluate the level of customer satisfaction with the truckload bin distribution program. The components that customers were asked to evaluate include: the *Earthmachine* composter; the information booklet; and the bin distribution method and service.

#### 4.2.6.1 Rating the Earthmachine

Most respondents acknowledged overall satisfaction with the *Earthmachine* unit. Over 90% of respondents said they were satisfied to very satisfied with the *Earthmachine* composter. Nine respondents even used the recommendations section to comment about how happy they were with the unit. Here is one account from a satisfied customer:

*We just love the unit the way it is! I bought two units and I can't wait to set up the second one. We would and have recommended it to all of our friends.*



**PHOTOGRAPH 4.1  
RCM VOLUNTEER DEMONSTRATING EARTHMACHINE CAPACITY**

Approximately 30% of customers surveyed provided recommendations on how the unit could be improved. Comments such as “bigger is better, so it doesn't get full too fast”, “larger capacity for me would be a help as every other time I cut the grass I keep the clippings for my compost bin, and “it’s a very good unit, but I find it too small for my needs” reflect the desire of many customers for a larger composter with a greater capacity to handle higher amounts of yard and kitchen waste. Need for a larger composter

provides some explanation as to why many customers decided to purchase more than one *Earthmachine*.

Other recommendations regarding the design include improvements to the lid and door connections as some respondents found the removable pieces had a tendency to fall off or were difficult to open during the winter. Larger access holes were suggested to improve the convenience of adding compost, harvesting finished compost, and turning the pile. As well, respondents felt that accessories such as compost aerator tools and food waste buckets should have been included in a package deal with the unit and would have made composting more convenient.

#### **4.2.6.2 Rating the Composting Information Booklet**

Approximately 87% of the respondents reviewed the composting information booklet distributed with the *Earthmachine*. The majority of respondents (86%) said they were satisfied to very satisfied with the content of the booklet. Positive comments regarding the booklet include:

*It is very well organized and informative. We find ourselves reading and going back to it for reference.*

*Written material is clear and concise - no suggestions.*

Few respondents (21) provided suggestions for improvement. However, there were some interesting comments and ideas worth noting. Comments such as, “need more simple instructions for typical beginner use” and “at times it provides way more information

than I want, to just make some compost”, indicate that a simpler more concise step by step list of instructions on what and how to compost would be beneficial for customers.

One customer suggested creating an information poster (preferably laminated and weather-proof) type display card with appropriate and accessible information that would make composting easier.

*(It) would be useful to have an information/reminder card that could be attached or hung near the composter, in kitchen or by the exit. Something weather proof perhaps? Card could have information on how to compost properly - something short, concise and illustrative with info on how to layer, what goes in, what doesn't go in etc.*

Instruction on composting in northern climates was another request made by respondents.

#### **4.2.6.3 Rating the Truckload Bin Sale Approach**

Over 86% of respondents felt very satisfied (31%) to satisfied (55%) with the City’s truckload bin sale. Customers were also provided with space to comment about their experiences and opinions regarding the truckload bin sale and the customer service. Analysis of the written comments are broken down into three categories a.) Positive Comments b.) Complaints and Criticisms; and c.) Recommendations for Improving the Truckload Bin Sale Approach.

#### **4.2.6.4 Positive Comments**

Those that were very satisfied had few complaints and voiced their overall approval of the service and bin sale experience providing remarks such as,

*You were wonderful!  
Top notch! Great service!*



*I thought the customer service was great! The line-ups went very quickly.*

Another customer that described his positive experience, provided the following comment,

*I found the truckload bin sale was very organized. Considering how many people were there, my wait was relatively short, About forty minutes. I met a few neighbours, too. Keep up the good work!*

Other satisfied customers felt the line-ups and waiting periods were very long but were pleased with the way staff efficiently coordinated sales and distribution of the bins. The following comment reflects this sentiment,

*With the large crowd at our site I was amazed at how orderly and fast moving our lines were handled.*



**PHOTOGRAPH 4.2**  
**“SO MANY TO CHOOSE FROM”**  
**CUSTOMER SELECTING AN EARTHACHINE**



**PHOTOGRAPH 4.3 VOLUNTEERS DISTRIBUTING BINS**

#### **4.2.6.5 Customer Complaints and Areas for Improvement**

Although feedback was generally positive, respondents certainly provided their share of complaints and areas of how the sale could be improved. Approximately 31% of the respondents provided written comments, complaints and recommendations. These include long waiting time, difficulties transporting bins, and having more time and resources for answering composting questions.

##### ***4.2.6.5.1 LONG LINE-UPS AND WAITING PERIODS***

*The length of the line-up (at the St. Vital location) almost put me off, but I wanted the Earthmachine composter. The line up took about 1.5 hours to get through, and parking was horrible, but I stuck it out and am very pleased that I did.*

The most frequent complaint was the long line-ups and the length of time customers had to wait before receiving a composter. Based on the comments section, customers stood in line for 45 minutes to a maximum of two hours with no guarantee they would receive a

composter. A few respondents complained about organizers running out of bins and accessories such as aerator tools and starter kits. The long hours of standing in line was especially difficult for senior citizens and other customers with physical disabilities. Some customers were pressed for time and could not wait. For example, one woman, after a lengthy waiting period, was forced to cut ahead (asking permission from other customers) because she had to leave for work. She writes,

*Caught off guard by the crowds even though I arrived at 8:00 a.m. opening; would not have made it to work for 11:30 or would have left empty handed if staff had not let me ahead.*



**PHOTOGRAPH 4.4  
MANY CUSTOMERS EXPERIENCED LONG LINE-UPS  
WHILE WAITING FOR A COMPOSTER**

Respondents criticized the inconvenience of the one-day sale, which helps create the “mad-rush” for a composter and the long line-ups. It was also argued by one customer that the one-day sale approach misses many residents. The customer criticized the sale believing that it merely attracted those that were already composting before,

*I would say that the way the sale was implemented was not appropriate. It attracted those who already were composting and did little to attract or convince people to start composting. One-day sales also miss a lot of people...*

These are certainly valid points to consider as results indicate that 40% of customers had been composting prior to the sale. It can also be argued that customers consist primarily of those that have positive attitudes towards composting and environmental initiatives but have yet to start composting.

#### ***4.2.6.5.2 LIMITED TIME FOR CUSTOMERS TO ANSWER COMPOSTING QUESTIONS***

The long line-ups also hindered staff and volunteers from being able to provide ample composting tips and advice. A handful of respondents commented that the sales staff did not have any knowledge about composting and could not answer customers' composting questions. The Compost Action Project information booths were there to offer composting advice and sign people up for workshops. However, booths were terribly understaffed with only two to three volunteers and staff on site for thousands of customers. After waiting for a couple of hours to receive their composter, most customers would likely be unwilling to wait in another line to receive advice.

#### ***4.2.6.5.3 PARKING AND TRANSPORTING THE COMPOSTERS***

Other difficulties experienced by customers during the sale were related to the parking situation and transporting bins to customers' vehicles. Parking was described as "congested", "disorganized", and "horrible". Respondents also found transporting composters to the vehicle to be difficult. This was the case especially for those with physical disabilities and for those that were forced to park a good distance away from the sale proceedings. Many customers opted to drive their vehicle closer to pick up their bins at the sales booth.



**PHOTOGRAPH 4.5 PHOTOGRAPH COMPOST HELP DESK**



**PHOTOGRAPH 4.6 CUSTOMER PLACING EARTHMACHINE IN THE TRUNK**

#### **4.2.6.5.4 LOCATIONS OF THE SALE**

Another point raised by customers was that the bin sale locations were organized mainly in the outskirts/suburb areas of Winnipeg. By limiting the sales to these areas, the truckload sale may have restricted access to customers who do not have vehicles and need to take the bus.

*Why did you only sell the bins outside of the centre of Winnipeg? You could have sold it in areas where there are lots of trees and leaves. West End, Wolsely, River Heights (i.e. Pan Am Pool), Grant Park Shopping Centre, Forks, City Hall, Legislative Building, would be other areas easily accessible by bus for people to get a composter.*

## **Customer Recommendations to Improve the Truckload Bin Sale**

Some respondents offered suggestions to how the bin sale could be improved. The most frequent recommendations focused on reducing line-ups and waiting periods for customers. These recommendations include:

- Having the sale for longer durations i.e. for more than one day, for a couple of weeks, or permanently throughout the year;
- Increase the number of bin sale locations in the City; and
- Have more staff & cashiers.

Another important recommendation from respondents was to provide better composting information for customers. Suggestions included training sales staff and having more volunteers on site to be able to answer composting questions, and providing a visual demonstration (at the event or at home) of how to use the *Earthmachine* and what to compost.

*The composter is very good but I would like to see a demonstration about the different stages and times and what goes into it to inform people when they buy these units.*

*I would have liked someone to come and show me how to turn, what I can put in the bin and what I shouldn't. I am not sure when the scraps are ready to go in the garden or flowerbed.*

Other notable recommendations included improving the organization and convenience of the event with better crowd control, more prominent signs with instructions of where to go, and more staff to provide guidance and to help carry bins to vehicles. One respondent also mentioned that there should be some form of entertainment for the large crowds. Entertainment in the form of music and performers could certainly improve the

mood of customers forced to stand in line for a couple of hours. A couple of customers also suggested providing a preorder/prepayment option for customers, where prepayment slips can be brought to the event site reducing time spent filling out customer cards and paying for bin. There were also customers that provided interesting suggestions based on their experience with bin sales in other provinces. One respondent from Lethbridge wrote:

*We moved from Lethbridge, Alberta in January 2001. In Lethbridge you can purchase the Earthmachine composter from the city, they will deliver it and the cost is included on your next utility bill.*

Another customer from Victoria said that he had to attend a composting seminar in order to receive a discount on the *Earthmachine*. These examples are important to consider when evaluating the bin sale and how overall changes can be made to improve customer service and the community's uptake rates.

#### **4.2.7 INFORMATIONAL SERVICES USED BY RESPONDENTS**

Residents that are composting or are interested in starting to compost have numerous resources available to them for composting information and advice. These include various composting related websites and books and Resource Conservation Manitoba's Compost Information Line and handouts. Each customer received a bookmark with the website address and the telephone number. Respondents were asked if they had utilized these or any other sources of composting information. A majority of respondents (85%) had not contacted any of the suggested services for further information or troubleshooting information.

#### 4.2.8 BARRIERS AND PERCEPTIONS TO HOME COMPOSTING

*Identifying barriers is an essential first step in designing a successful program. While significant pressures exist to skip this step, the simple truth is that it is impossible to design an effective strategy without identifying barriers. (McKenzie-Mohr & Smith 1999)*

Truckload bin sales are designed to alleviate many of the barriers related to composting including lack of education and awareness, economic cost of purchasing a composter, and providing a composting system that increases convenience with composting tasks. The literature review highlighted several common barriers and negative perceptions related to home composting that hinder participation rates. These include:

- Lack of available space;
- Lack of understanding and education of how to compost properly;
- Lack of awareness of composting;
- Concern for pests and insects;
- Inconvenience of composting duties such as taking organic waste to the composter and tending a compost pile;
- Inconvenience of obtaining a composter;
- Economic barrier of purchasing a composter;
- Lack of motivation;
- Lack of social norms; and
- Climate primarily in northern regions that experience harsh winters.

(McKenzie-Mohr & Smith (1999); Angus Reid Group Inc (1996))

Identifying persistent negative perceptions among customers would help identify barriers to long-term composting behaviour. The degree of which negative perceptions still existed among respondents was assessed through Question 17 of the survey. Negative



perceptions paralleled with composting problems including flies, composting taking too long to break down, and winter composting. At least 30% felt that composting attracted flies and composting took too long to break down. Meanwhile 48% agreed that it was too cold to compost during the winter.

Chi-square analysis also revealed that there was a statistically significant difference in opinion between previous composters and new composters related to problems. Experienced composters that were surveyed (experienced less problems during use of the composter) were more likely to not feel composting duties were inconvenient, to have a more positive attitude towards home composting, and were less likely to feel that climate, flies, capacity were an issue than respondents that were new to composting or had not started to use their composter. Ongoing positive composting experiences can alleviate negative perceptions and barriers and reduce potential problems.

#### **4.2.9 BIN SUBSIDY FEEDBACK AND OPINIONS**

*There should be no question as to this type of subsidy. It not only motivates people to compost, but composting reduces landfill waste.*

*I think it is fantastic that the City is willing to encourage people to compost, thus reducing the amount of waste in our landfills.*

*Having the sale was a very good initiative; everyone should have one at a discounted price.*

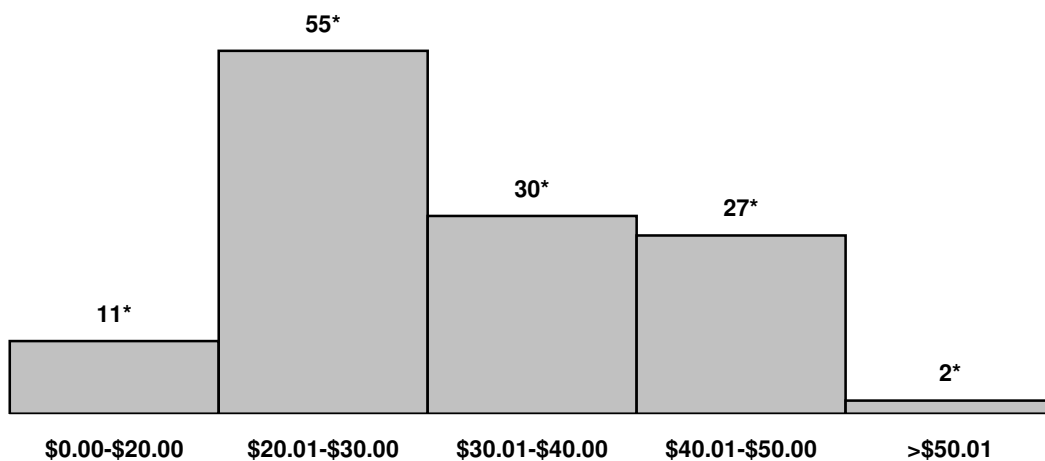
The results indicated respondents' support for the financial assistance program to encourage home composting. Many felt the program was "good use of tax dollars" and "money well invested" since it raised local awareness and encouraged many people to get involved with composting. Respondents also felt that the subsidy would provide overall

benefits to the community by reducing landfill waste, improving home soil conditions and reducing the cost of residential waste pick up. These themes are reflected in many comments including the following:

*Considering the expense of pickup and the limited space available at the dump, it does not make sense to bury leaves and grass clippings when you get free mulch and new earth out of a composter. If it encourages half the people who bought a unit it is worth composting.”*

*Because it is so important to reduce the waste that has to go to the landfill, I think by subsidizing the cost, the governments made the composters affordable to many families. By having a sale like this, composting is discussed and some people can get swept into action by talking to others.*

Selling the bins at a reduced cost had a significant impact on customers’ decision to purchase a composter and subsequently start composting. Over 80% of respondents said they would not have purchased a composter at the retail price (\$80.00-\$90.00). Customers were asked to provide a price they would be willing to pay for the *Earthmachine* bin if the subsidy was not available. There were 115 total responses and Figure 4.5 provides the price breakdown from respondents.



**FIGURE 4.5 RANGE OF PRICES RESPONDENTS WERE WILLING TO PAY FOR EARTHACHINE COMPOSTER**

As shown in Figure 4.5 most customers would not have paid much more than the \$25.00 price. The largest total number of responses (55) were within the \$20.01-\$30.00 range. Only two respondents said they were willing to pay more than \$50.00 for the *Earthmachine*. The average cost that respondents would have been willing to pay for the composter had there been no subsidy was \$34.22.

For many respondents, the price was the deciding factor in starting to compost, feeling that they would not have been able to afford the *Earthmachine* without the subsidy.

These sentiments are reflected in the following comments,

*The subsidy is what compelled me to buy the unit. If no subsidy was given I would still not be composting because the units for me are prohibitively expensive.*

*I hope the City of Winnipeg continues to subsidize this unit. We are on a limited budget and would find it extremely difficult to afford the unit if the cost was more than \$25.00.*

*I am a single mom and would never have done composting without it (subsidy). I am now teaching a three year old about composting and recycling (blue box) with the subsidies.*

*...if the bins were not on sale for such a low price, I would still not own one and would not be composting. The regular price of compost bins for my household is in my opinion not worth the benefits of owning one.*

Other customers, many of who were composting prior to the sale, felt they would not have purchased the composter without the subsidy. The general consensus with this group was that the regular price was too high or that the plastic style bin was not worth \$80.00.

*In my mind the composter is not worth \$80.00. It is an old "classic" design in a modern look. In my mind, composters must be re-engineered starting from a clean sheet of paper to make them easy to use and look good. This is necessary to get wide acceptance.*

*I would have not have purchased this unit at a retail outlet for \$80.00, I would have chosen an alternative unit.*

*It is just a plastic container, \$80.00 is too much to pay for this composter.*

*Too expensive! Retail price of \$25.00 is maximum price would pay.*

Customers also gave comments about what they would have done if the *Earthmachine* were sold at regular price. These options include continuing to compost with their current system purchasing a different, purchasing a cheaper unit, and paying for the materials to build their own “sturdier” composter. A few customers went as far as saying they would have preferred and paid much more for a larger wood composter.

The sale price also encouraged experienced and inexperienced customers to purchase more than one bin. This is suggested by the following comments,

*It offered me the chance to get two composters so I would have enough room to put compost material, and I would have one (composter) going all the time.*

*At the price they were sold, three were purchased. One for a relative, one for a friend. At \$80.00 I would not have purchased three.*

Other comments indicated that previous composting households felt the sale was a good opportunity to upgrade their current composting system, increase the amount of organic material composted by the household and improve the convenience of composting at their household.

There were also respondents that provided interesting comments voicing support for the subsidy, but also reflecting the desire for the City and Province to do more to encourage home composting and waste reduction. Recommendations include:

- Penalties to manufacturers that over-package products;
- Implementing landfill bans on yard waste

*... allowing for garbage pickup of yard waste – 20 bags of leaves going to the landfill!*

- Providing incentives for new homeowners to encourage them to reduce waste,

*Houses (new) should be given a composter (and a blue bin) at no charge to encourage both new, young couples and middle-aged families to begin composting.*

- Development of a city wide composting program,

*I feel that both the Province and the City have environmental responsibilities regarding all categories of waste management. Winnipeggers have demonstrated their support for the Blue Box recycling program, what about a citywide composting program! If the City is not prepared to initiate a program the least they can do is subsidize the purchase of residential composting bins.*

- Garbage levies to help subsidize composters,

*The subsidy could be funded through an additional levy...*

- Providing subsidized bins year-round, and

*Recycling bins are sold for \$5.00 the city was really serious about getting people to compost they would have bins available for a low price throughout the year.*

- Offering of free composters for residences, a method that has shown success in other Canadian communities such as Kitchener-Waterloo and Centre-South Hastings, Ontario (McKenzie-Mohr 2000, RCM 2003).

*Composting units should be provided free of charge to all homeowners and random checks made if being used.*

#### **4.2.10 ESTIMATING WASTE DIVERSION POTENTIAL**

Waste diversion potential for the City's truckload bin sale was estimated based on numbers from the Winnipeg waste composition study (Earthbound Environmental 2000) and Bagby's (2000) waste diversion formula:

Waste Diverted From Home Composting = NBD x UR x (YWG + FWG) x CF x ER =

Where:

- NBD = Number of Bins Distributed;
- UR = Usage Rate of Bins;
- YWG = Yard Waste;
- FWG = Food Waste Generated;
- CF = Compostable Fraction; and
- ER = Composter Efficiency Rate

The City of Winnipeg truckload bin sale distributed 8866 bins. There were two usage rate values, short-term and long-term, used to calculate “high end” and “low end” waste diversion. The usage rate calculated from the follow-up surveys was taken as the short-term usage rate (88%). Bagby (2000) suggests communities can expect 70% long-term bin usage rate from large-scale bin sales, and was used to calculate long-term usage rates. The values for Yard and Food Waste Generated and Compostable Fraction were taken directly from the Winnipeg waste composition study. CF for food waste is the percentage of pre-consumed vegetable and fruit waste. The CF for yard waste is the percentage of grass clippings and leaves. Bulkier yard waste such as tree pruning is left out because they are more difficult to compost and most residents do not own a chipper. Two different composter efficiency rate values are used for yard and food waste. Based on its size and customer feedback, the *Earthmachine* is capable of handling a larger fraction of food waste than yard waste. Thus, food waste composting efficiency is estimated at 80%, while yard waste composting efficiency is estimated at 60%. Using these figures, the truckload bin sale had the potential to divert approximately 324-386 metric tonnes of organic material during the first year of use (combined weights of food, yard and bin made from recycled materials) and 243-305 tonnes after the first year of use. This calculates to an average of 28-35 kg/yr diverted from each bin.

#### 4.2.11 COST SAVINGS

To estimate avoided costs, the cost per tonne of organic waste diverted from the distributed bins was calculated. The cost per tonne diverted by bins sold at the truckload bin sale averaged out to \$15.75-19.28/tonne diverted. Based on these figures, it will take only 2.42 years for the City to break even on its initial investment; savings resulting from the avoided landfill expenses will average \$19,800/yr and total cost savings during the 10-year lifespan of an *Earthmachine* is approximately \$150,084.

**TABLE 4.2 WINNIPEG WASTE COMPOSITION STATISTICS**

	<b>Per Capita Weighted Average Food Waste (kg)</b>	<b>Compostable Fraction of Food Waste</b>
<b>Total</b>	68.9	= Fruit & Vegetable Waste/Total Food Waste X 100 = 41.7/68.9 x 100 = 60.5%
	<b>Per Capita Weighted Average Yard Waste (kg)</b>	<b>Compostable Fraction of Yard Waste</b>
<b>Total</b>	11.4	= Grass & Leaves/Total Yard Waste x 100 = 9.6/11.4 x 100 = 84.5%

*Source: Earthbound Environmental 2000*

**TABLE 4.3 COSTS OF LANDFILLING WASTES IN WINNIPEG**

<b>Cost of Landfilling Waste</b>	<b>ESTIMATED COSTS IN WINNIPEG</b>
<b>Total Cost per Tonne to Landfill Waste = Total Costs/Annual Tonnes Waste Generation</b>	<b>Estimate \$70.00/tonne to landfill waste</b>

*Source: RCM 2003*

**TABLE 4.4 WASTE DIVERSION POTENTIAL TRUCKLOAD BIN SALE**

<b>NBD</b>	= 8866 Bins (assume that the number of customers that returned their bins = number of customers that received a bin after the sale)	<b>Estimated Food Waste Diverted</b>	High End
			= (8866 Bins) x (0.88) x (68.9 kg) x (0.605) x (0.80) = 260 181 kg/yr
			Low End
			= (8866 Bins) x (0.70) x (68.9 kg) x (0.605) x (0.80) = 206 962 kg/yr
<b>UR</b>	= 88% (short-term); assume 70% long-term usage rate	<b>Estimated Yard Waste Diverted</b>	High End
			= (8866 Bins) x (0.88) x (11.4 kg) x (.845) x (0.60) = 45 094 kg/yr
			Low End
			= (8866 Bins) x (0.70) x (11.4 kg) x (.845) x (0.60) = 35 871 kg/yr
<b>ER</b>	= Assume 80% composter efficiency rate for food waste & 60% composter efficiency for yard waste	<b>Estimated Total Waste Diverted</b>	High End
			= 260 181 + 45 094 = 305 275 kg/yr = 305 tonnes/yr
			Low End
			= 206 962 + 35 871 = 242 833 kg/yr = 243 tonnes/yr
			Range
			= 305 to 243 tonnes/yr
<b>Weight of Bins:</b>	<b>Waste Diverted from Manufacturing of Bins:</b>	9.1 kg x 8866 bins = 80681 kg = 81 tonnes	
	<b>Total Diversion</b>	1 <sup>st</sup> Year = (305 + 81) to (243 + 81) = 386 to 324 tonnes	
	<b>Average Waste Diversion from Each Bin Distributed</b>	(305 275 kg/yr)/(8866 Bins) = 34.43 kg/yr (242 833 kg/yr)/(8866 Bins) = 27.39 kg/yr	
<b>1<sup>st</sup> year's estimated diversion:</b>	<b>Average Waste Diversion from Each Bin Distributed + Waste Diverted from Manufacturing =</b>	34.43 kg + 9.1 kg = 43.53 kg 27.39 kg + 9.1 kg = 36.49 kg	



**TABLE 4.5 ESTIMATED COSTS SAVINGS FROM BINS DISTRIBUTED**

	<b>Truckload Bin Sale</b>
<b>Total Cost of Program</b>	\$48 000
<b>Lifespan of Bin</b>	7-10 years
<b>Total Diversion During Bin Lifespan</b>	= $(243 \text{ t/yr}) \times (10\text{yr})$ to $(305\text{t/yr}) \times (10\text{yr})$ = 2430 to 3050 tonnes
<b>Cost/Tonne Diverted:</b>	= $[\$48\ 000/2430]$ to $[\$48\ 000/(3050)]$ = \$15.73/tonne to 19.75/tonne
<b>Avoided Costs Per Year</b>	1 <sup>st</sup> Year = $(\$70.00 - \$15.73)/\text{t} \times 381 \text{ t/yr}$ = \$20, 677/yr Following Years = $(\$70.00 - \$5.40) \times 305 \text{ t/yr}$ = \$19 703/yr
<b>Total Avoided Costs</b>	= $\$20, 677/\text{yr} + (19\ 703 \times 9 \text{ yr})$ = \$198 004
<b>Years to Break Even</b>	= Total cost of Program/Average savings/yr = $\$48\ 000/\$19\ 800/\text{yr}$ = 2.42 yrs
<b>Total Cost Savings</b>	= Savings Years X Average Savings/yr = $(10 - 2.42) \text{ yrs} \times \$19\ 800/\text{yr}$ = \$150 084
<b>Government Subsidy</b>	\$5.00/Bin
<b>Gross Earning Potential for Manufacturer</b>	= $(5.00+25.00) \times 10\ 000 \text{ bins}$ = \$300 000
<p><b>* ESTIMATED COST/TONNE TO LANDFILL WASTE</b>  <b>**ESTIMATED COST/TONNE FOR TRUCKLOAD BIN SALE</b>  <b>***ESTIMATED COST/TONNE FOR COMPOSTING EDUCATION AND SUPPORT</b></p>	

### **4.3 WHAT DOES IT ALL MEAN? DISCUSSING FINDINGS FROM THE TRUCKLOAD BIN SALE CASE STUDY**

#### **4.3.1 HIGH PROPORTION OF NEW AND INEXPERIENCED HOUSEHOLDS PARTICIPATING**

Approximately 60% of respondents were found to be beginners with little to no prior experience with home composting. If this value is representative of the over 6000 residents that purchased a bin, the truckload bin distribution program that included promotion and advertising of bin sale and home composting and discounted prices for bins appears to have been effective in attracting borderline composters, (residents that generally agree with home composting but do not participate). The high percentage of inexperienced customers also has implications to long-term participation rates and success of the program. Assuming that customers having prior experience (depending on the quality of their previous experiences) are less likely to experience problems or require follow-up support, customers with little to no experience composting should require on-going “troubleshooting” support as they learn how to compost. Greater efforts put forth towards providing composting education and training for these beginners should presumably encourage higher composting efficiency rates and fewer problems.

#### **4.3.2 MOTIVATING FACTORS FOR PURCHASING A COMPOSTER**

Respondents highlighted several key reasons for buying a bin and starting to compost. These matched the findings of the literature review. For example, most respondents said that the environmental benefits of composting and personal satisfaction of helping the

environment were very important in their decision to purchase a composter. Environmental benefits are often cited as significant motivators to home composting,

*It is likely that households who compost derive personal satisfaction from this behaviour... Waste reduction appears to be a high motivator to begin as well as to continue composting” (McKenzie-Mohr & Smith 1999).*

An advertising and promotional campaign that effectively communicates the environmental benefits of home composting can go a long way in persuading those citizens that have genuine altruistic desires to help the environment.

The discounted price of the bin also played an important role in encouraging customers to purchase a composter. For most respondents the reduced price was a significant factor in their decision to purchase a composter and to even start composting. Many respondents stated that they would not have purchased a composter or would not have started composting if the bins were offered for regular price. Thus, the results coincide with the notion that...“By reducing or eliminating the cost of bins to residents an economic barrier is removed that may have otherwise limited participation in the program” (Resource Conservation Manitoba 2003).

#### **4.3.3 RESPONDENTS FOUND USING BINS TO COMPOST KITCHEN AND YARD WASTE**

Of the 193 customers that respondents, 170 or 88% claimed to have started to use their composter. Despite expectations that customers lacking in previous composting experience would be the ones that did not start composting, of the twenty-three that had not started to use their *Earthmachine*, ten were beginners and nine had previous composting experience. The participation rate represents short-term bin usage rates, which based on previous composting studies, are typically high. The results of the survey

are consistent with other follow-up studies results including City of Brandon, which found over 90% of units surveyed in use after one year (City of Brandon 2003) and the Toronto Home Composting Study that found approximately 97% of the respondents had started using their composting units (Maclaren 1990). Survey results showed respondents were composting both kitchen and yard waste. Pre-consumer fruit and vegetable scraps, leaves; garden trimmings; and grass clippings were the most common material composted by respondents. These materials offer a good mix of organic constituents to promote an efficient composting process.

Non-composting households gave a variety of reasons for not using their Earthmachine composter. Many of these non-composting respondents had yet to assemble and position the composter in the yard because they had just moved, were trying to decide where to put it in the yard, were in the middle of landscaping and/or backyard construction, or they simply had not found the time to get started. These reasons support the notion that composting can be inconvenient to start because it requires a certain amount of motivation to first purchase a composter, set it up and then proceed to start using it (McKenzie-Mohr & Smith 1999). External barriers such as available yard space can be a strong deterrent to composting behaviour. Participating in home composting has not yet become the norm to the extent that recycling has in Winnipeg. Until home composting (and in a larger context respect for ecological principles) becomes woven into the fabric of modern culture and adopted into household lifestyle and behaviour, many residents may perceive it as just another chore added to an already hectic schedule.

#### **4.3.4 CUSTOMER FEEDBACK ON TRUCKLOAD BIN DISTRIBUTION PROGRAM**

Customer satisfaction with the composter model, the information booklet, and the one-day sale approach was also assessed. Respondents were generally satisfied but raised some valid issues with each of the truckload bin sale components. For instance, the *Earthmachine* performed well with respondents. However, its lack of capacity limited its effectiveness and household waste diversion potential of each household. Problems experienced by customers centered on the bin filling up too quickly, especially during the winter months when biological activity slows down considerably. Several respondents (those presumably producing large amounts of yard and kitchen waste) felt a larger unit would fit their needs better by being able to compost a greater amount of household organics. Interestingly, some customers opted to purchase more than one unit (or was willing to do so in the future) to compost more of their household organics. Most respondents said they would not have paid more than \$25.00 for one *Earthmachine*. The scenario begs the question: for those customers willing to pay \$50.00 for two composters with the capacity of the *Earthmachine*, would they be willing to pay a higher price for a composter with double or triple the capacity?

Respondents considered the information booklet to be effective reference material. The booklet provided ample information especially for beginners that are learning how to compost. Some respondents did feel that the booklet could be more concise. One interesting recommendation was to provide a poster or sign with a checklist of composting instructions. This could also alleviate the problem of losing or misplacing the information booklet. How to compost in northern climates is a key component to

composting in Winnipeg that is not included in the *Earthmachine* composting information booklet<sup>6</sup>. Considering Winnipeg's climate, winter composting information is key information lacking from the booklet. Having this information available may have eased some of the problems experienced by many households during the winter months. Perhaps a checklist of procedures in a calendar-like format providing how-to compost tips during seasonal variations in Winnipeg may be a more effective medium.

Respondents considered the one-day truckload sale approach an effective method to distribute thousands of composters in such a short period of time. Approximately 9000 composters including aerator tools and how-to information booklets were distributed to thousands of residents. The sale also provided RCM with a valuable opportunity for composting promotion and education. The RCM booths located at each sale location had volunteers on-hand to distribute handouts on composting and contact information for the composting telephone hotline; sign up customers for future composting workshops and provide on the spot composting advice.

The one-day sale approach however, left much to be desired in terms of customer convenience. Common complaints from respondents included extremely long line-ups, traffic congestion, lack of staff and poor parking availability. Having the sale for only one day may have also been a deterrent for some residents, limiting access to residents

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<sup>6</sup> During the winter, a compost pile will generally lay dormant with biological activity slowing down considerably. Households can continue to add kitchen scraps but do not need to continue mixing a frozen pile. Layers of brown material can be added in the spring when the pile defrosts and there is a steady supply of leaves and dried grass. Another tip is having a secondary container (such as a garbage can) outside near an exit. This will limit the number of trips a person will have to take to the composter. Odours should not be an issue as kitchen scraps will freeze over the winter.

that had the time and patience to wait in line and pick up a composter on that particular day. Some customers admitted to purchasing bins for friends and family who could not be at the sale. Long line-ups and transporting composters to vehicles was certainly more difficult for customers with physical disabilities. Notable customer recommendations to improve waiting period included: offering subsidized bins for longer than a day, pre-payment of bins and pre-customer registration prior to the sale day, and pre-distributed order forms to help shorten the administration and processing time needed for each customer.

The combination of long waiting periods and lack of composting-savvy staff also resulted in few opportunities for customers to ask composting questions. With approximately 60% of customers having little or no previous composting experience, it is somewhat negligent to provide a product to a customer without proper explanation on how to use it. Granted, most customers will be able to figure out how to start composting without having any problems, though answering questions and providing composting tips at the point of sale should encourage more effective use of bins.

Customer feedback regarding subsidized bin prices raises some interesting points for discussion. First, if this type of economic incentive, where the cost of composting is essentially subsidized, can be effective in encouraging thousands of residents to start composting, what type of combined impact would garbage levies have on composter sales and home composting rates? With the controversy of garbage levies fresh in residents' minds, it is logical to suggest that the "threat" of user fees motivated customers

to purchase a bin. If ongoing discussions from City officials lead to a user-fee based system, the demand for composters should increase as well.

Programs throughout North America have shown that municipalities can continue to provide bin sales for years without saturating the public's demand. For example, an evaluation of Portland, Oregon's bin distribution program revealed that even after distributing a total of 60 000 bins between 1994-1999, home composters remained in high demand.

*The findings of the report were surprising. Metro staff had assumed that the demand for compost bins would be saturated after many years of sales. In fact, strong unmet demand still exists in the region and could exceed 100,000 bins. Forty-four percent of all single-family households in the region compost at home using a variety of methods. At current levels, it will take over ten years of annual sales before demand is saturated. The bin distribution program alone has accounted for 47% of the growth in the region's home composting participation rate. (Foseid 2001)*

Is the City of Winnipeg prepared to have these sales for years to come? If so, there are several improvements that can be made such as increasing accessibility to discounted bins, offering more than discounted bins, providing more opportunities for education and collaborating with local partners with common goals that can aid as well as benefit from a more comprehensive bin distribution program.

What happens during the rest of the year when the sale price is not available? Will residents who are not composting be as motivated to start if this incentive and these composters are not available throughout the year? It is safe to assume that customers are less likely to purchase composters at regular price (or for more than \$25.00) if they expect the City to offer the bin sale. The truckload bin sales are coordinated



predominantly without the involvement of local composting manufacturers and retailers. This raises questions about the impact the truckload sale (where only one bin is subsidized) has on local businesses and non-profit organizations that sell composters.

For example, *Lumberlovers*, a local business focused on manufacturing wood bin composters made entirely of recycled lumber admitted that the truckload bin distribution program negatively affected their sales (Murphy 2002). *Lumberlovers* did not sell a single composter after the City's truckload bin sale and prior to the pilot bin delivery program, which offered *Lumberlovers* bins for \$25.00 (See Chapter Five). Fort Whyte Environmental Interpretive Center has also sold composters (wood cedar bins) in the past to fundraise for their organization. These are examples of organizations that could help promote home composting. They could benefit from a more collaborative bin distribution program if they were welcomed into the planning process. There are also a number of local retailers that sell other bin models such as Lee Valley Garden Tools, Home Depot, McDiarmid Lumber and Canadian Tire. By providing only the *Earthmachines* at subsidized costs, customer choices are limited and local retailers are forced to reduce prices or see their bin sales dwindle. The Centre and South Hastings Home Composting Program in Ontario, for example, offers five different models to residents: "basic backyard", "*Earthmachine*", "Ecobalance Yard Waste Bin", cedar composters, and skid row yard waste composters (RCM 2003). A more comprehensive bin distribution program could offer a number of different models at discounted prices varying in size, design features and material.

#### **4.3.5 CREATING SOCIAL NORMS**

Home composting, compared to curbside recycling, is a relatively unseen act with limited opportunities for creating norms. A perhaps unsung benefit from the truckload bin distribution program is that they provide high profile events where large numbers of residents interact with other community members who are also participating in home composting to some degree. Creating a “feel-good” atmosphere where customers are commended for their efforts and can interact with other environmentally conscious members of the community can provide positive reinforcement for their composting behaviour and help internalize composting behaviour within a community or as McKenzie-Mohr (2000) describes, help create norms in the community, where composting is perceived as the “right thing to do” and what “should be done.” Furthermore, creating situations where community members can discuss and promote composting to their peers is said to be more effective in encouraging behaviour often perceived as inconvenient and time consuming like home composting. As McKenzie-Mohr (2000), suggests with behaviour that is normally perceived as inconvenient: “...norm is most likely to develop through direct contact between people rather than through campaigns that rely upon prompts or information alone.”

#### **4.3.6 ESTIMATED WASTE DIVERTED, COST SAVINGS, AND COMMUNITY BENEFITS DEMONSTRATE VALUE OF TRUCKLOAD BIN DISTRIBUTION PROGRAM**

The truckload bin sale had the potential to substantially increase residential diversion rates and along with significant cost savings from residential garbage pick-up. Based on the results of the surveys and Winnipeg waste composition figures, the bins sold had the

potential to divert approximately 324-386 metric tonnes of organic material during the first year of use and an average of 243-305 tonnes/year every year after. This translated to an average of 28-35 kg/yr diverted from each bin. The cost per tonne diverted by bins sold at the truckload bin sale averaged out to \$15.75-19.28/tonne diverted (based on \$70.00/tonne cost to landfill waste). Based on these figures, it will take only 2.42 years for the City to break even on its initial investment; savings resulting from the avoided landfill expenses will average \$19,800/yr and total cost savings to the City during the ten-year lifespan of an *Earthmachine* is approximately \$150,084. The waste diverted also translates to significant reductions in greenhouse gases from methane producing organic materials diverted from the landfill and reduced fuel consumed by garbage trucks. When considering as well the important community benefits of the sale such as: increased environmental awareness; public participation in home composting; and health benefits of composting (recreational activity and improved environment), the value of the truckload bin sale and its contribution to sustainability in Winnipeg is noteworthy.

#### **4.3.7 FUTURE RESEARCH OPPORTUNITIES**

Although determining early rates of usage is important, it is premature to assume that those respondents found to be composting will continue to do so for years to come. Long-term participation rates of bin sale customers are expected to drop and further studies would be beneficial in determining the lasting impacts of the sale. As well, without visual confirmation or sampling of composted material, the research does not provide adequate data to calculate effective composter usage rates (how effectively owner is composting) or the percentage of actual household waste diversion. Types of

material composted and problems experienced while composting were assessed during this study. However, measuring the amount of material composted and a customer's willingness to speak to peers about composting were areas not covered. Meanwhile, no respondents had harvested or made use of finished compost material, indicating that there may not have been enough time for customers to produce finished compost.

Follow-up studies conducted within five and ten years of the sale would help to alleviate these data gaps and would provide valuable information regarding the bin distribution program's effectiveness in encouraging residents to adopt composting in their lifestyle, long-term composter use and the durability of the *Earthmachine*. Additional follow-up can include home visits to obtain visual confirmation that customer is continuing to use the bin and collect data on quantity and type of materials being composted. This data can be used to determine if households are using bins effectively. Past programs and composting studies have also developed composter usage indices that rate how effectively a household is composting. Usage ratings can be based on information that includes:

- Types of materials composted;
- Amount of material composted;
- Problems experienced;
- Harvesting and use of finished compost material; and
- Willingness to speak to peers about composting.

#### **4.4 THE VERDICT ON THE TRUCKLOAD BIN SALE**

The combination of promotion, advertising, discounted price and convenient access to bins was effective in attracting borderline composting households to purchase a bin. Overall customers were generally pleased with the truckload bin distribution program. The sale was an effective promotional vehicle for composting in the city of Winnipeg. Results have indicated that a high percentage of customers have started to use their bins to compost both kitchen and yard waste. Problems during initial year of composting were minimal and most respondents expected to continue to use their composter indefinitely. Long-term use of bins distributed by the sale has the potential to divert a substantial amount of household organics from the waste stream. This in turn translates to thousands of dollars in savings resulting from reduced curbside collection of household garbage and therefore, reduced fuel consumption. It also means tremendous positive environmental impacts by reducing greenhouse gas production both at the landfill (methane) and from garbage trucks (carbon dioxide, water vapour). However, there is much more that can and should be done in terms of improving customer service during the sale and ensuring accessibility to all residents. Customers, especially new composting households, will require ongoing education and promotion. Follow-up evaluation and providing ample opportunity for customer feedback are program components that must be incorporated to ensure continuous improvement and achievement of program goals and objectives.



## **CHAPTER 5**

### **ROT-TO-YOUR-YARD COMPOSTER HOME DELIVERY PROGRAM**

*Delivering bins door-to-door, offering a quick Q&A session, and installing them for each recipient further increases the likelihood of unwilling composters' participation. Follow-up calls and post-installation visits will also increase the sustainability of the efforts (RCM 2003).*

#### **5.1 INTRODUCTION**

The following chapter provides a synopsis of the citywide “Rot-to-Your-Yard” composter home delivery program conducted from September 2001 to January 2002. The Chapter summarizes the events during the manufacturing and delivery of the composter and the results of the follow-up surveys. Topics discussed include: the ratio of previous and new composting households; factors that influenced customers to purchase a composter; previous composting experience; customer satisfaction level with the sale components; the significance of the bin subsidy; waste diversion potential and estimated cost savings. The Chapter also highlights the challenges experienced while conducting the program, and concludes with a section discussing advantages and disadvantages to the delivery approach, and recommendations for the program.

##### **5.1.1 ACCOUNTS OF THE DELIVERY PROGRAM**

Before discussing the results of the follow-up surveys, it is important to highlight the significant achievement of completing the delivery portion of the project to describe what was involved in implementing a locally based composter delivery program.

### 5.1.1.1 Promotional Activities

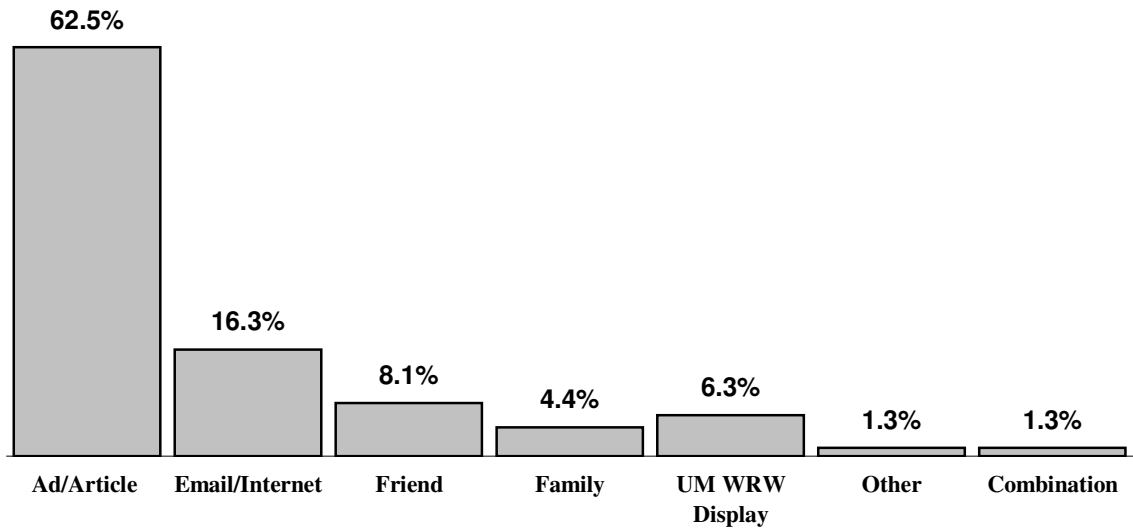
As discussed in Chapter Three, there were three methods used to advertise and promote the bin sale. These methods included advertisements and articles in the Transcontinental Weeklies (TCWs), an article in the Manitoban, press releases emailed to various community and student (see related appendices) newsletters, and a display at the University of Manitoba for Waste Reduction Week (2002) showcasing the composter, a vermi-composter and educational material. “Word of mouth” was another informal method used to promote the sale to peers and family members. Figure 5.1 shows that the ad and articles in the TCWs were by far the most effective promotional methods employed. This is understandable as Winnipeg distribution of the TCWs is estimated at approximately 170 000 households and total readership at over 300 000 adults (TCW 2003).



**PHOTOGRAPH 5.1**

**WASTE REDUCTION WEEK DISPLAY AT UNIVERSITY OF MANITOBA**





**FIGURE 5.1 HOW PARTICIPANTS FOUND OUT ABOUT COMPOSTER SALE**

#### **5.1.1.2 Challenges In Manufacturing the Composters**

*Lumberlovers* Wood and Pallet Recycling, a small company operated by its founder, Mr. Shaun Murphy, was awarded the contract to manufacture the composters. At the time, Mr. Murphy had built and sold hundreds of composters to Winnipeg residents and operated the only company capable of manufacturing all the composters for a reasonable price. The *Lumberlovers* product was also promoted by RCM as a suitable comparison to the *Earthmachine*. The bin features an attractive and user friendly design that includes: a removable lid and front panel, slats that promote air flow but that are narrow enough to prevent large animals and rodents from entering the bin, and very large capacity (nearly 900 litre volume). The bin is made of local recycled lumber that is not pressure treated.

There were challenges and unfortunate setbacks that caused delays during the manufacturing period. The amount of time needed to complete the contract was greatly

underestimated. The first setback occurred at the end of September 2002 when *Lumberlovers* was forced to move its operations. The original site was being rented out to *Lumberlovers* by a local business, however, the property was owned by Manitoba Hydro and was being leased without authorization. *Lumberlovers* was forced off the property threatening Mr. Murphy's livelihood and the completion of the project.

With more than one hundred composters left to build, the researcher was forced to find temporary space for *Lumberlovers* to store equipment, composters and continue the project. First, twenty composters were brought to the Winnipeg Boys and Girls Club head office parking lot on Main Street. The next step taken was to speak with the University of Manitoba Waste Prevention Coordinator (at the time it was Mr. Robert Altemeyer) and Mr. Ed Reseutek, the University of Manitoba, Physical Plant Manager, to find out if there was any space at the University of Manitoba campus for *Lumberlovers* to relocate its operations and continue manufacturing the composters. Luckily, Mr. Reseutek was able to donate an abandoned outdoor lot, which provided more than adequate space for Murphy to finish manufacturing the remaining bins. During the last week of September 2002, the researcher, along with a number of Mr. Murphy's friends and associates, helped transport all the necessary equipment and supplies to the new location at the University of Manitoba. This location would serve as *Lumberlovers'* base of operations for the next eight months.

While at the new site, additional complications caused further delays in manufacturing. Mr. Murphy's supply of recycled lumber had been depleted and he was having difficulty

finding material from his main source, Motor Coach Industries (MCI). Mr. Murphy spent weeks searching various wood scrap sources for material to complete the remainder of the composters. During that time, construction and deliveries were put on hold. Another shipment of crates from MCI finally came in early November providing enough material to complete the project.

At this point (mid November), temperatures had dropped considerably. With operations being outside, it was difficult for Mr. Murphy to spend extended periods of time constructing the bins. Equipment breakdowns also occurred causing further delays. Despite all of the setbacks, construction of the composters was completed in mid-December.



**PHOTOGRAPH 5.2**



**PHOTOGRAPH 5.3**

**LUMBERLOVERS BIN ASSEMBLY LINE**



**PHOTOGRAPH 5.4**



**PHOTOGRAPH 5.5**

### **PUTTING THE PIECES TOGETHER: MURPHY CONSTRUCTING BINS**

#### **5.1.1.3 Composter Deliveries and Demonstrations**

As Mr. Murphy had agreed to subsidize the cost of the bins for the benefit of the project, the researcher decided to provide personal support in delivering the bins. The researcher agreed to assist the delivery program by taking orders, creating delivery schedules, searching for additional support to deliver the bins, and providing physical assistance to deliver the bins. Eventually the researcher took full responsibility of conducting deliveries allowing Murphy to focus solely on constructing the bins. A description of the methods used to take orders and create a database of customers is provided in Chapter three. In terms of searching for additional support, delivery assistance was requested from the Winnipeg Boys and Girls Club (WBGC) Step-Up Youth Work Experience program, which had the potential to provide a passenger van to transport bins and paid labour to deliver the composters. This would have been a tremendous opportunity not only to reduce costs and time, but also to connect with a charitable youth leadership program. The partnership however, did not materialize and support from WBGC was limited to one adult staff person assisting in the delivery of a few composters.

Mr. Murphy and the researcher began deliveries and by having two individuals transporting the composters (which weighed approximately fifty kilograms each) deliveries were conducted much faster. As well, each individual had fairly extensive knowledge on how to compost ensuring customers would receive adequate composting information for them to start and be successful. Joining Mr. Murphy on the deliveries also gave the researcher an opportunity to meet each customer that would be participating in the follow-up surveys, answer their questions, and receive feedback about the bin and the program. It was anticipated that this approach, which devoted time to setting up composters, provided demonstrations and a resource manual, would alleviate many “composting anxieties” for beginners, improve the convenience of starting to compost and result in a high bin usage rate.

Conducting the deliveries had its share of challenges and difficult situations. The amount of time energy, and resources required to deliver the composters was greatly underestimated by the researcher. The average length of time spent for delivering each composter ranged from thirty minutes to an hour depending on the distance traveled, time spent at each residence setting up the composters (some yards with high fences and narrow gates were very difficult to move the composter into) and explaining composting, and any delays that may have occurred along the way (e.g. getting lost, customer not home etc.). Due to the average length of each delivery, weekday deliveries were reduced to three to five evening deliveries and eight to ten per day on the weekends.

After securing the use of a half-ton truck and committing personal funds to cover fuel costs, the researcher committed the following month and a half to personally complete the remaining deliveries before the new year. The task was certainly more challenging with one delivery person. The most time consuming task was transporting the composters from the truck to backyards. Having one person transporting the composters required rolling the bins (a technique learned from Murphy) and manoeuvring them through narrow gates or over tall fences.

Delivering the composters alone extended delivery time for each household and made it more difficult to provide customers with an accurate time of arrival. The researcher would often arrive at a customer's house late at night and was forced to set the composters up in the dark. The winter weather in Winnipeg also proved challenging. The snow and frigid temperatures produced some long, frustrating hours.

Although there were difficult moments, delivering the composters was a worthwhile experience. The researcher was introduced to a wide range of residents who were enthusiastic about composting and the project. The enthusiasm conveyed by a majority of the customers served as a steady reminder as to why the program was created.



**PHOTOGRAPH 5.6  
GREAT WALL OF COMPOSTERS**



**PHOTOGRAPH 5.7  
LOADING UP FOR DELIVERY DAY**



**PHOTOGRAPH 5.8  
COMPOSTER DEMONSTRATION**



**PHOTOGRAPH 5.9  
COMPOSTING CHAT**



**PHOTOGRAPH 5.10  
TWO THUMBS UP FOR COMPOSTING!**



**PHOTOGRAPH 5.11  
COMPOSTING A FAMILY AFFAIR**



**PHOTOGRAPH 5.12  
CUSTOMER DEMONSTRATING BIN'S  
ROOMY INTERIOR**



**PHOTOGRAPH 5.13  
GETTING A HEAD START ON  
COMPOSTING**

## **5.2 PARTICIPANTS SPEAK: RESULTS FROM CUSTOMER SURVEYS**

Follow-up surveys were administered approximately six months after the bins were delivered to evaluate the impacts of the bin delivery program. The main goal was to see how effective the combination of tools including: reduced bin prices, delivery, and personalized educational was in persuading participants to start composting.

### **5.2.1 RATIO OF PREVIOUS COMPOSTING HOUSEHOLDS AND NEW COMPOSTING HOUSEHOLDS**

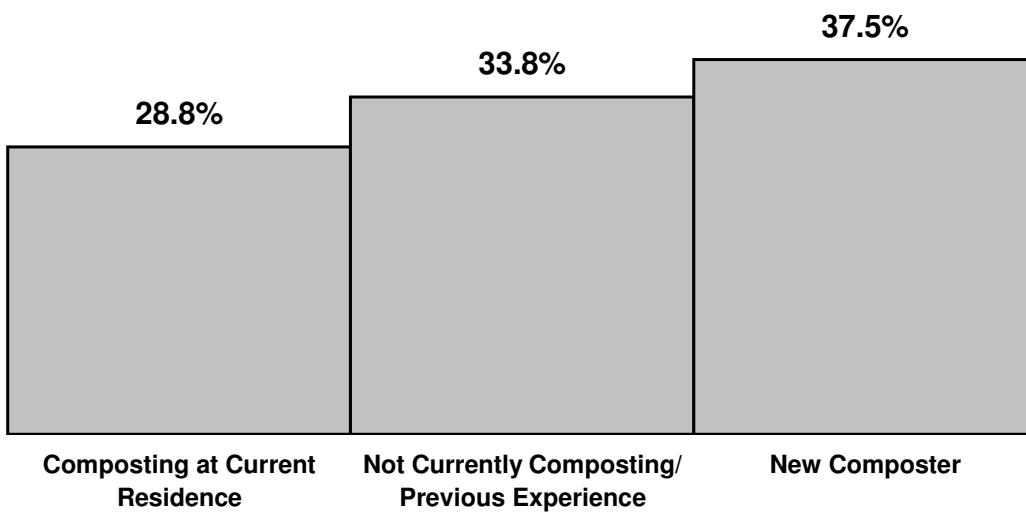
One of the main objectives of the project was to provide composters to residents that had never composted before. Prior to purchasing a bin, all 160 customers were asked a series of questions to establish their level of composting experience. Customers that were not currently composting and had little previous experience were given first priority to a composter. Nearly all customers requesting a composter received a unit. There were however, three customers that were turned away. Two of these individuals had



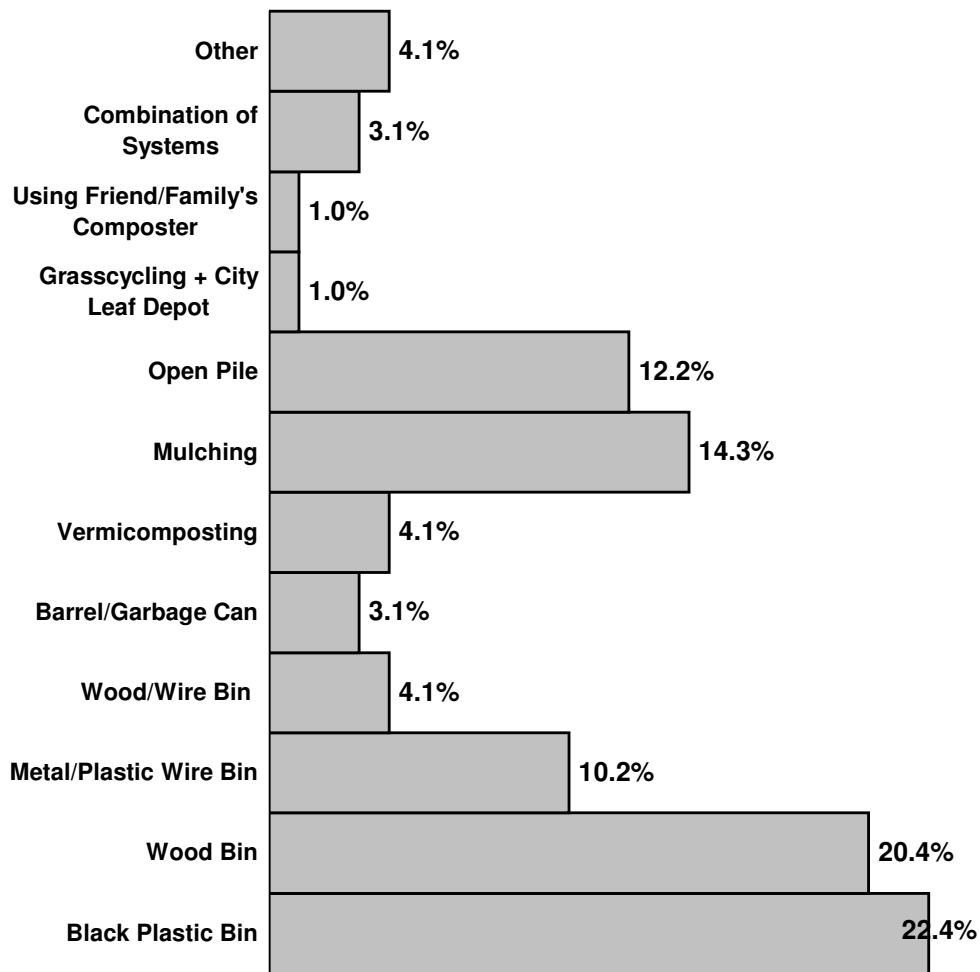
purchased a bin from the City of Winnipeg Truckload sale. There was also a customer from Pinawa that emailed his request for a composter and was told that the delivery program could only distribute bins in Winnipeg. Feedback from one customer also revealed that the advertisement likely deterred customers who were currently composting from ordering one.

The pre-purchase surveys revealed that those requesting a compost bin had varying levels of composting experience. This included residents that were composting without a compost bin (vermi-composting and mulching), had composted previously but stopped because their system was not effective or they had moved, and those that were currently composting with another type of compost bin. Other bin types included Garden Gourmet plastic model, barrel composter, variations of wood composters and vermi-composters. Follow-up was conducted with 44 of the 160 customers. Figure 5.2 and 5.3 show the results of the “pre-purchase survey”. Composting experience for the 160 customers is summarized into three categories: A. Composting at Current Place of Residence (28.8%), B. Not Currently composting but with Previous Composting Experience (33.8%) and C. New Composters (37.5%). Figure 5.3 provides a summary of the types of composting systems used by households with previous composting experience. Systems used range from basic piles and mulching techniques, plastic home composters, and large wood turning bins constructed by the customer. One other interesting observation was that there were customers that had participated in the City’s composter rebate program. These customers were upgrading their unit, which had been used for approximately eight to ten years.

A total of 45 out of 55 customers contacted completed a survey for a response rate of 82%. Of the 45 respondents, (52%) had no previous composting experience, fifteen (34%) had previous experience but were not currently composting, and six (14%) were composting previously with various types of composting systems.



**FIGURE 5.2 OVERALL CUSTOMER LEVEL OF COMPOSTING EXPERIENCE**



**FIGURE 5.3 TYPES OF COMPOSTING SYSTEMS USED BY PREVIOUS COMPOSTERS**

**5.2.2 REASONS FOR PURCHASING A COMPOSTER**

One of the primary objectives of the survey was to identify common reasons and motivations that led to customers purchasing a composter and participating in the University of Manitoba Home Composting Study. The factors that influenced the customers' decision to purchase a composter are illustrated in Table 5.1

**TABLE 5.1 FACTORS FOR PURCHASING A COMPOSTER:  
PERCENTAGE OF RESPONSES**

<b>FACTORS</b>	<b>NAAI</b>	<b>SI</b>	<b>N</b>	<b>I</b>	<b>VI</b>	<b>DK</b>	<b>NA</b>
<b>Reduce Household Waste</b>	0.0	9.1	4.5	11.4	<b>75.0</b>	0.0	0.0
<b>Satisfaction from Helping Environment</b>	0.0	4.5	9.1	27.3	<b>59.1</b>	0.0	0.0
<b>Producing Compost</b>	2.3	11.4	2.3	36.4	<b>47.7</b>	0.0	0.0
<b>Saving Money on Fertilizers</b>	22.7	9.1	<b>22.7</b>	22.7	20.5	2.3	0.0
<b>Encouraged by Someone</b>	<b>38.6</b>	6.8	15.9	22.7	9.1	4.5	2.3
<b>Access to Composting Information</b>	11.4	11.4	18.2	<b>43.2</b>	13.6	0.0	2.3
<b>Sale Made It Affordable to Purchase Composter</b>	4.5	0.0	6.8	40.9	<b>45.5</b>	0.0	2.3
<b>Wanted to Start Composting - Sale - Good Incentive</b>	4.5	2.3	2.3	34.1	<b>54.5</b>	0.0	2.3

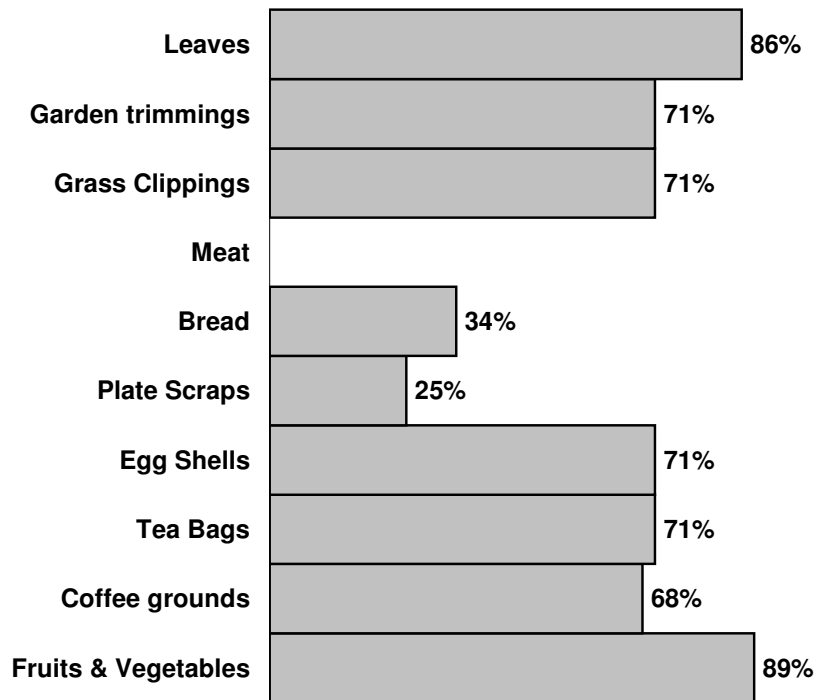
**NAAI** – Not At All Important      **SI** – Somewhat Important      **N** – Neutral  
**I** – Important      **VI** – Very Important      **DK** – Don’t Know  
**NA** – Not Applicable

A combination of factors motivated customers to purchase a bin. Environmental benefits of composting were the most significant factors influencing customers with over 85% saying that reduction of household waste, satisfaction of helping the environment and producing finished compost were “Very Important to Important” in their decision to purchase a composter. The sale price of the bin, which was reduced from \$75.00 to \$25.00 also proved to be crucial to the high uptake rate. Approximately 86% said it was “Very Important to Important” that the “Bin Sale Made it Affordable to Purchase a Composter”. As well, 89% answered “Very Important to Important” when considering the statement: “I Have Wanted to Start Composting for a While and the Sale Provided a Good Incentive to Start”. Program features such as the delivery service and the composting information booklet, curiosity of learning about the composting process, and

desire to participate in the composting study were additional reasons provided by customers. Two respondents also made reference to how composting reduced the labour, waste and cost of filling garbage bags with leaves during the spring.

### **5.2.3 MAJORITY USING THEIR LUMBERLOVERS COMPOSTER**

Of the 44 customers surveyed, 41 (93%) stated they had started to use their composter within the first six months of purchasing it. Twenty of these respondents also participated in an in-person interview, which provided visual confirmation of composter use. The in-person interviews provided opportunities to observe the composting methods used by the customer and the materials composted. Respondents were composting both kitchen and yard waste. Figure 5.4 shows that at the time of the survey, over 85% were composting fruit and vegetable waste and leaves. Seventy-one percent of customers said they were composting grass clippings, garden trimmings, eggshells and tea bags. Fewer respondents said they were also composting coffee grounds (68%), bread (34%) and plate scraps (25%).



**FIGURE 5.4 PERCENTAGE OF ORGANIC MATERIALS COMPOSTED BY RESPONDENTS**

While observing methods used by participants, respondents were seen utilizing many of the tips given during the demonstration and from the “how to compost” booklet. For example, customers were advised to use a container to collect kitchen waste and reduce trips to the composter and make the overall process much more convenient. Several interviewed participants were effectively using this method. Here is the account of one respondent who had successfully integrated this technique composting into her daily routine...

*I set a clean white plastic pail beside my sink and wrote on it what should and should not go in so my family would use it. Initially I did not think I would continue to put material into the bin all winter but I found that it was so easy to do, and I have so much kitchen waste (fruit + vegetables, peels etc) to go in that I have continued with it all winter and am looking forward to reaping the benefits this summer.*



**PHOTOGRAPH 5.14  
BIN & CART COMBINATION MADE  
COMPOSTING LEAVES MUCH  
EASIER FOR THIS CUSTOMER**



**PHOTOGRAPH 5.15  
COMPOSTING EVEN DURING THE  
WINTER!**



**PHOTOGRAPH 5.16  
SAVING FALL LEAVES FOR  
COMPOSTER**



**PHOTOGRAPH 5.17  
ADDING FOOD SCRAPS TO THE BIN**



**PHOTOGRAPH 5.18  
CUSTOMER FOUND SUCCESSFULLY  
COMPOSTING RABBIT WASTE &  
YARD TRIMMINGS**



**PHOTOGRAPH 5.19  
COMPOSTING WITH A TRULY  
CANADIAN AERATOR TOOL**



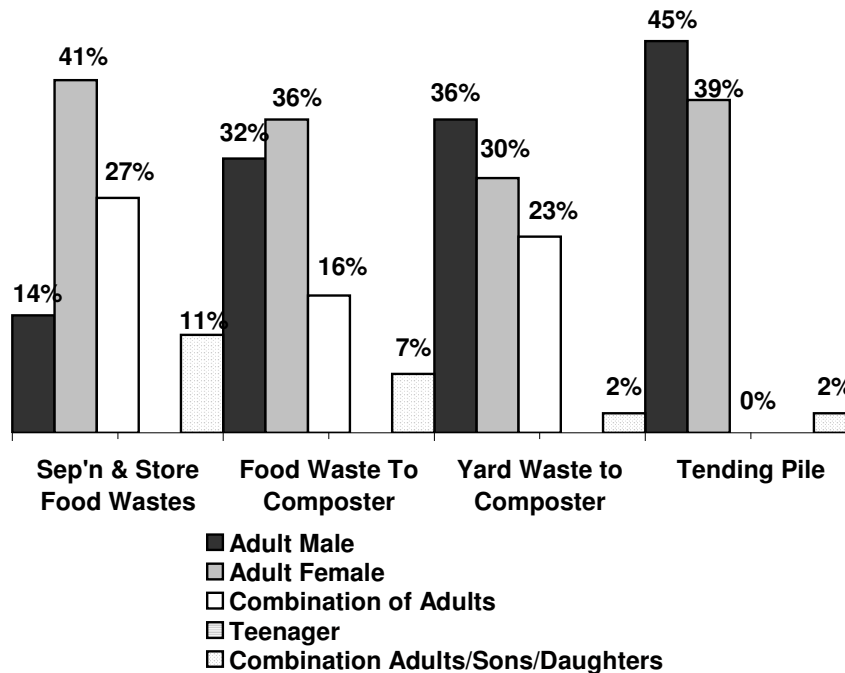
**PHOTOGRAPHS 5.20  
CUSTOMERS USING VARIOUS METHODS TO COLLECT KITCHEN SCRAPS**

Only three respondents stated that they had not started to use their composter. These respondents cited cold weather, losing the information booklet, and fear of rodents as reasons for not composting. The customer fearful of attracting rodents had read in the information booklet that installing wire mesh would prevent rodents from entering the bin. She had yet to install the mesh and therefore had not started composting. All three non-composting respondents said they would eventually use their composter.



### 5.2.4 COMPOSTING RESPONSIBILITIES

Figure 5.5 illustrates the findings related to composting duties. Although a small percentage of households surveyed had children involved with composting duties, the adult household members were primarily responsible for all composting duties. Among households surveyed adult females were most likely to be responsible for separating and storing kitchen wastes (41%) and taking food waste to the composter. Adult males were most likely to be responsible for taking yard waste to the composter (36%) and tending to the compost pile (45%).

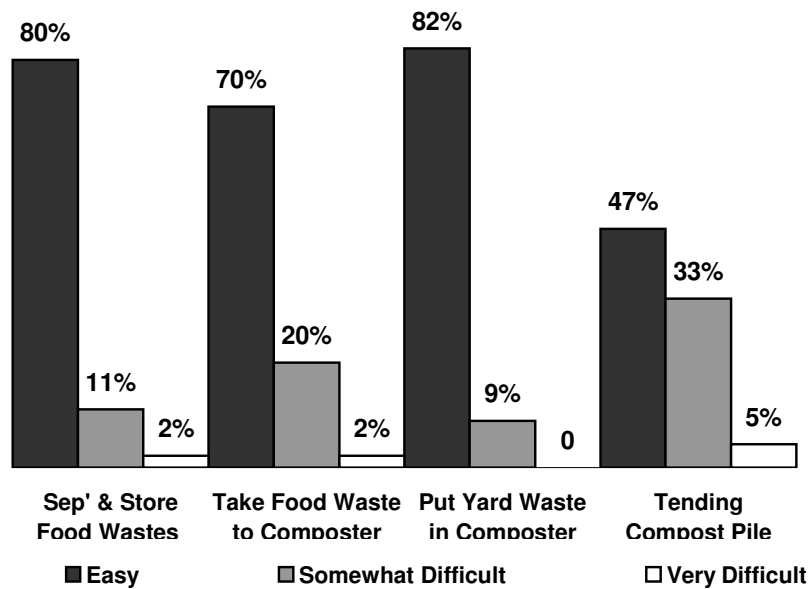


**FIGURE 5.5 DISTRIBUTION OF COMPOSTING RESPONSIBILITIES AMONG HOUSEHOLD MEMBERS**

### 5.2.5 LEVEL OF DIFFICULTY WITH COMPOSTING TASKS

Households that had begun to use their composter were asked to rate the level of difficulty for each composting task. The results of their responses are summarized in

Figure 5.6. Duties were for the most part considered easy by respondents (“separating and storing kitchen wastes” (80%); “taking food waste to the composter” (70%); “putting yard waste in the composter” (82%); and tending the composter (47%). Tending the composter which involves turning the pile, watering and harvesting finished compost was considered the most difficult task with at least 38% of respondents rating it as “Somewhat Difficult to Very Difficult.”



**FIGURE 5.6 RATING THE LEVEL OF DIFFICULTY OF EACH COMPOSTING TASK**

### 5.2.6 PROBLEMS EXPERIENCED BY RESPONDENTS

Composting households were asked to describe problems they may have experienced while composting, the severity of each problem and how they were dealt with. The responses are summarized in Figure 5.7 and highlight the fact that very few participants experienced serious problems while composting. Over 80% of respondents experienced

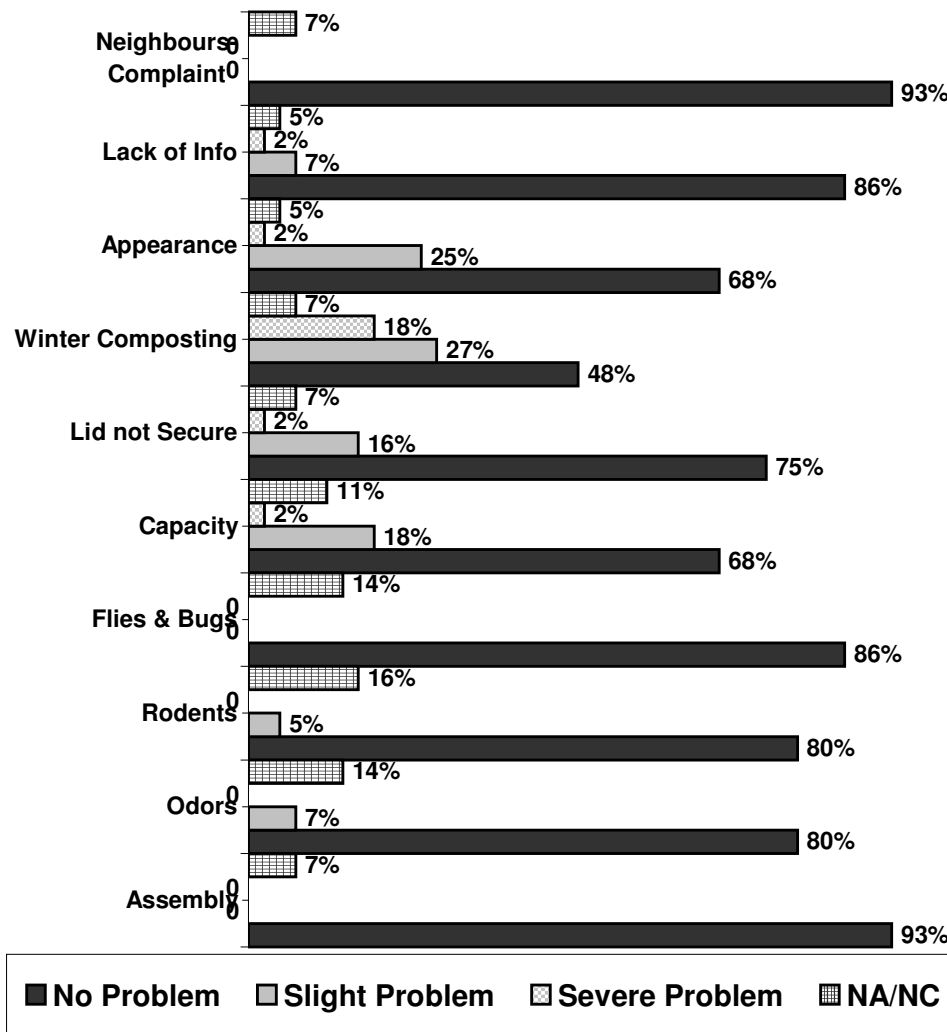
no difficulties with the following potential problems: Assembly of Unit (93%), Odours (80%), Rodents (80%), Flies and Bugs (86%), Lack of Available Composting Information (86%), and Complaints from Neighbours (93%). A majority of respondents also experienced no problems with the following: security of the lid (75%), capacity of the bin (68%), appearance of the bin (68%), and winter composting (48%).

Respondents did exhibit some scepticism regarding their “problem free” experience commenting that having the composters delivered during the fall and winter most likely resulted in fewer problems with odours, rodents and insects and that these potential problems may surface during the spring and summer months. There was one reported incident where a customer found a mouse in the composter before the cold weather began. (Note NA/NC in the legend key represents Not Applicable/Not Composting).

Respondents that experienced slight to severe problems while composting highlighted winter composting, appearance of the composter, and capacity of the bin as being the most significant issues. Nearly 45% of respondents cited having “Slight to Severe Problems” with composting during the winter. There were three respondents that stopped composting temporarily during the six months. Two out of the three stated that the cold winter weather was the primary cause. Aside from the typical inconvenience of bringing kitchen waste to the composter in cold weather, one customer cited problems with snow build up on the lid. Few customers offered solutions other than using a secondary container (bucket, pail, or garbage can) near the house to reduce trips to the composter during the winter, a tip highlighted during deliveries and included in the information

booklet. Here is the account of one customer who had continued to compost throughout the winter...

*I have been collecting material all winter for my bin. It is out back and not readily accessible in winter. At the time of this survey I have not checked my compost brew from last fall. In the fall I collected leaves from neighbours' yards, orange peels, banana peels, coffee grinds from my kitchen.*



**FIGURE 5.7 PROBLEMS EXPERIENCED WHILE COMPOSTING**

Aesthetic quality of the bin is an important feature that is discussed earlier in the Chapter and resurfaces with the follow-up results and customer feedback. A majority of the

customers had no problem with the appearance of the bin and commented about how much they liked the “look” of the wood bin. However, approximately, 27% did feel there was a slight to severe problem with the appearance of this particular model. Some of these respondents felt the bin was not very attractive, while several others decided to paint and stain the outside of the bin to improve its appearance and match the colour of their fence.

A smaller proportion of respondents experienced slight to severe problems with lack of capacity (20%) and the lid (18%). Customers that had experienced capacity problems were located in areas with extremely large backyards, producing a tremendous amount of leaf and grass waste, much more than *Lumberlovers* bin (as well as a majority of commercial bins) can handle. Meanwhile lid problems included the cover swelling up during rainy weather and the winter making it difficult to close the top and one customer having his lid stolen from his composter. The lids unfortunately do not come attached to the main body of the composter and this isolated incident was by far the worst lid problem experienced by any of the customers.

Another customer who was contacted to conduct a follow-up interview had moved to another house after receiving the composter. Although they had started to use the composter, the couple had moved during the winter months and was forced to leave the bin behind because it was frozen to the ground. They requested another bin in the hopes of receiving the same price. With all the 160 composters sold, the researcher instead offered to transport her bin to their new location if they participated in the in-person

interview. In the end, the customer received her old composter and some valuable insight was revealed regarding external factors that can negatively impact a person's motivation to compost. Moving to a new home is a stressful time during which activities such as composting simply are not a priority. Any measure added to improve the convenience of composting for a busy household, such as home delivery, can only help to improve the chance that residents will start and continue to compost.



**PHOTOGRAPH 5.21  
UNCOVERING HEALTHY PILE OF  
COMPOST**



**PHOTOGRAPH 5.22  
COUPLE HAPPY TO HAVE THEIR BIN  
DELIVERED TO NEW HOME**

### **5.2.7 CUSTOMERS EVALUATE THE BIN DELIVERY PROGRAM:**

The survey provided respondents with an opportunity to comment on various aspects of the composter delivery program including the *Lumberlovers* unit, the composting information booklet and the delivery service.

#### **5.2.7.1 Rating the Lumberlovers Composter**

The *Lumberlovers*' composter scored highly among with respondents. As illustrated in Figure 5.8, 75% of the respondents were "Very Satisfied" while 25% were "Satisfied" with the unit. (One should note, however, that not everyone that was sent a survey

actually replied including one customer in particular who wanted to return the composter upon delivery). Comments provided were related to how pleased they were with the design, appearance, ease of use and size of the unit as well as its capability to compost large amounts of material as indicated by the following comments,

*...a well-designed unit, simple and functional, I cannot see any obvious improvements to be made...*

*...its very big and holds a lot, haven't had any problems really, accessibility is great!*

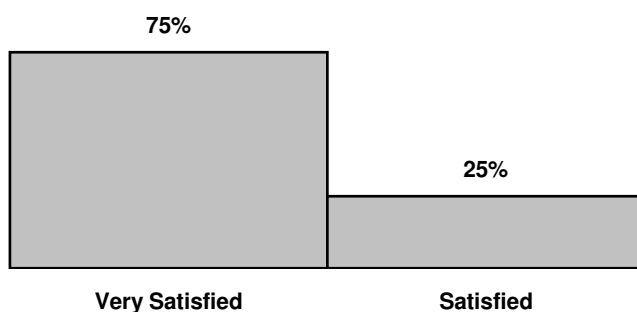
*no suggestions - I really like the appearance and design! I will probably stain it to match my deck*

Respondents were also impressed that the composter was constructed from recycled materials. One customer commented on how she had not taken advantage of the City of Winnipeg bin sale because she wanted a wood composter.

*I prefer of the choice of a natural wood bin. We have passed on the offers of the black plastic bins – aesthetics, capacity, materials used, ease of use, turning – I prefer the wood!*

Lastly, some respondents were so pleased with the bin that they were willing to show and talk about their composter to friends and family, demonstrating a high level of customer satisfaction,

*I am impressed with the quality of the bin and have showed it off to a few friends!*



**FIGURE 5.8**  
**CUSTOMER SATISFACTION LEVEL WITH LUMBERLOVERS COMPOSTER**

**5.2.7.1.1 RECOMMENDATIONS FOR IMPROVING THE BIN**

Other customers were satisfied with the unit but felt that the bin could be improved if the design were altered or components were added. A common recommendation from respondents was to attach hinges and a handle to the lid to make it more convenient to open and to avoid slivers. One customer that was visited took the time to add these components to the lid of his composter and was pleased with the results. Another customer, who had experienced some difficulty with material spilling out of the bin when turning the compost pile, suggested having the front panel in two pieces to prevent compost material from falling out of the bin. Another customer felt that the convenience of accessing finished compost could be improved by building a lower hatch or base to improve convenience and proceeded to construct one for his bin. Two other customers requested that wire mesh be installed to prevent rodent access. One of these customers installed wire mesh on her own, while the other is planning on installing it to her bin before she starts composting. Constructing the bin to have a slanted top allowing water and snow to slide off the lid was another recommendation provided by customers.

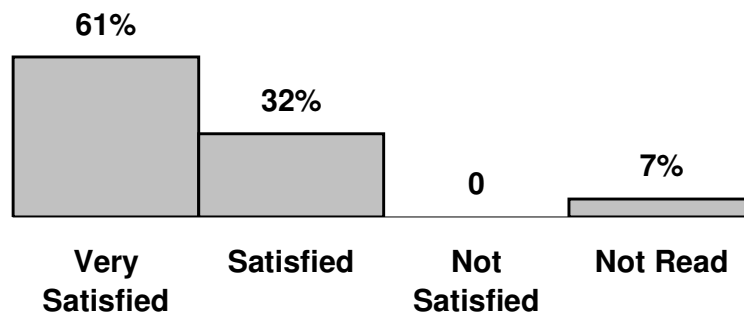


A few customers felt that the overall appearance of the bin should be improved. As to how the bin could be improved, recommendations included better selection of wood during construction, sanding down the panels, and painting or staining the bin. Several respondents decided to paint and stain the bin to improve its appearance and match their fence or patio.

Another common recommendation from customers was to offer different sized units for different households. Although the bin was designed to produce optimum composting results and produce a large amount of material, the size does limit the bin to households with ample yard space. Many residents with limited yard space and smaller families would prefer a smaller unit. In fact, two potential customers with limited yard space could not fit the bin in their backyard and turned down the offer. The size of the bin also presents some problems with those residents with physical limitations who may find it difficult to turn or mix the compost pile especially if the bin is full. Providing a smaller option for customers would alleviate turning difficulties and encourage customers with limited yard space to purchase a bin. Providing custom-made bins would undoubtedly increase the associated production costs and manufacturing time. However, these are important recommendations that should at least be considered. If a customer is willing to pay for the extra costs of labour and materials, these types of modifications can help to improve overall convenience and ease customer apprehensions and barriers to composting. Including an aerator tool, which improves the ease of mixing a compost pile, in a sales package would also make turning easier.

### 5.2.7.2 Customers Rate the Information Booklet

The households surveyed were asked if they had reviewed the composting information booklet. Those customers that had reviewed the booklet were asked to rate it and offer suggestions for improvement. Only three out of the 44 customers surveyed had not read the booklet. Customers were generally pleased with the booklet as illustrated by Figure 5.9, which shows that over 90% of respondents were satisfied to very satisfied with the booklet.



**FIGURE 5.9 LEVEL OF SATISFACTION WITH COMPOSTING INFO BOOKLET**

Positive comments regarding the booklet include,

*Excellent source of information, lots of great ideas. Cannot think of any way to improve it”*

*It seems very comprehensive, and*

*Love it!*

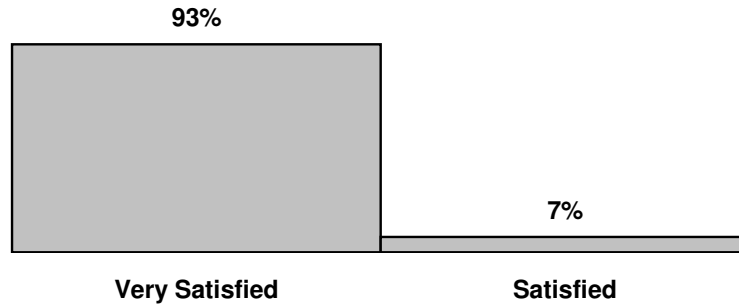
Other customers commented that although they had not read the material thoroughly, it was good to have the booklet for reference as questions and problems surfaced.

Respondents provided some important recommendations to improve the information booklet. At least two customers had lost the booklet, suggesting that a more convenient, larger format could be utilized. One customer recommended creating a weather-proof placard that could be placed on or near the composter or a laminated poster for the kitchen to provide a short illustrative list of how and what to compost. This type of “prompt”, would be more accessible and would provide concise instructions in a visible, appropriate location for residents to use. The same participant also suggested creating a basic website or composting forum that offers advice for composting questions as well as composting tips and instructions. There is already an abundance of internet websites offering free composting information including RCM Compost Action Project Homepage. However, interactive features such as a comment and question page or a composting forum could be used to upgrade the site. The booklet also included the Internet address but perhaps could have been better highlighted. As well, customers could have been given RCM bookmarkers, which include the Compost Info Line Telephone number and the web address. Another important recommendation made by a respondent was to translate the booklet and information into French. Offering composting information, education, and workshops in different languages would certainly be beneficial in encouraging diverse communities in Winnipeg to compost.

### **5.2.7.3 Customers Rate the Delivery Distribution Method**

The feedback from respondents regarding the delivery distribution approach applied by the project was extremely positive. Figure 5.10 shows that the overall level of

satisfaction was very high with 93% of households surveyed being “Very Satisfied” with the quality of service and 7% “Satisfied”.



**FIGURE 5.10 LEVEL OF SATISFACTION WITH QUALITY OF SERVICE**

Most comments given were focused on:

- The high quality of service;

*They were friendly, helpful, on time and set it up, what else can you ask for!*

*I can see no need to improve the service. Delivery was both convenient and courteous.*

*Very pleasant and obliging; Excellent service!*

- How effective the bin sale and delivery program was in getting the customer to start composting; and
- How they would not have participated without the composter being delivered...

*This program certainly did motivate me to start composting*

*Service was very good. Very effective, I probably wouldn't be composting if they didn't offer the good price and come and set it up.*

*The entire service from the start was perfect for someone like me who knows nothing about composting, doesn't have the time to research it, but wants very much to do more for the environment!*

*Extremely effective approach, without program probably still wouldn't be composting. Had looked at composters before, but didn't know enough about composting and didn't buy one. For a composter of this size, would have needed a large vehicle to transport it back to house.*

Respondents provided some recommendations for improving the service. These include:

- Spending more time explaining composting with beginners;
- Delivering composters before the cold winter months; and
- Conducting follow-up after one full year of use to provide a more adequate evaluation period.

### **5.2.8 BIN SUBSIDY FEEDBACK AND OPINIONS**

Comments and opinions expressed by respondents indicate strong support for the subsidy and for continuing the composter delivery programs. Many participants felt the overall bin distribution program was very effective, in encouraging residents to start composting, providing comments related to how they would not have been composting without the promotion; how easy it was to start composting with delivery, set up and education; how this approach is capable of encouraging a broader range of residents to compost and how pleased they were to be a part of the study. The following customer comments express these sentiments.

*Keep it up, if you can afford it. The composter delivery to door and education was great. The delivery might be enough encouragement to get lazy environmentalists to start composting.*

*Excellent program, it made me start composting, glad I did. It created more awareness for myself and my friends and family. I will recommend it to my friends. It is easier than people think and contrary to popular belief, they don't stink. Information provided was great. Delivery of compost was very convenient and prompt.*

*The bin is great and the info package answered all of my questions and gave me good suggestions. The price was excellent and it was so convenient to have it delivered. Especially by people who know how it works and could answer questions.*

*This was an excellent opportunity to purchase a quality wooden unit and help in voicing our comments, to assist in improvements and encouragement in providing helpful and beneficial end product which adds to the ability to grow – fresh produce and brighter & “happier” flower beds without worrying about over-fertilizing and soil compaction with our heavy soils. Thank you so much for this project. It has been of benefit to me as I have a disabled spouse and this is financially much appreciated again I thank you.*

Respondents were particularly supportive of the subsidy feeling low priced composters should continue to be offered. Respondents felt that the low cost of the composter was a strong incentive to participate in the program and that the subsidy encourages a wider range of citizens to compost.

*The subsidy was good motivation to get started.*

*It is a great idea. It seems to encourage wider use of composting*

*I agree with it and feel it should be continued, I would have built my own if subsidized unit was not available, the subsidy, probably gets more people into composting.*

*Very beneficial, probably required to introduce it in areas where there is little support or for individuals not certain about it.*

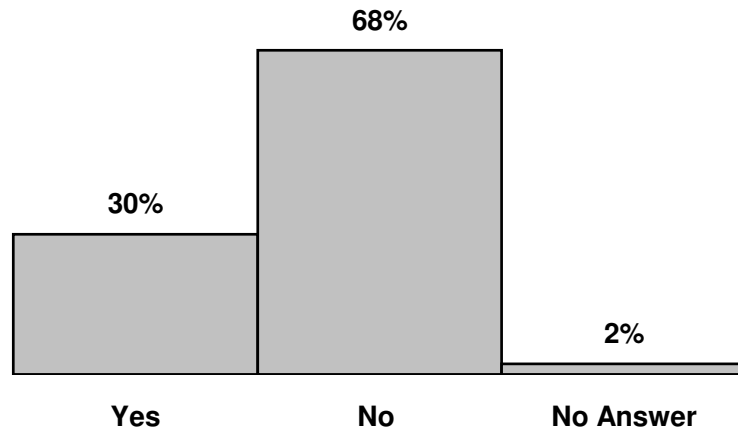
Respondents also commented on how they would not have purchased a bin (and subsequently would not have started composting) if the bin was sold at regular price.

*If this was not available we likely would not have been able to participate. I think this is a very beneficial subsidy - there are some bad choices of subsidies but I think this is actually a very good choice. I would highly recommend that this be continued!*

This response coincides with the opinion that lower income households should have opportunities to purchase bins at lower prices, providing them with an incentive to start composting ....

*The government should subsidize lower-income households to encourage as many people as possible to compost.*

Figure 5.11 shows that 68% of the respondents would not have purchased the composter at the regular price of \$75.00.



**FIGURE 5.11 PERCENTAGE OF RESPONSES TO QUESTION: "IF NO SUBSIDY HAD BEEN AVAILABLE WOULD YOU HAVE PURCHASED YOUR COMPOSTER?"**

Customers also commented about how \$25.00 was a good price for most people to start composting. This is especially the case for customers who are unable to afford the regular price of the bin and cannot build their own composter,

*The subsidy would be useful in making sizeable units available to more families. Any assist with cost in this regard can only benefit to consumers.*

*Should be kept up for the people who cannot afford to buy at a higher price or who cannot build their own as I would have done.*

or for those borderline composters that have wanted to compost for a while and simply require some extra incentive to start.

*I think it is a good idea to encourage more people to start composting. \$25.00 plus tax is probably a good price point to get those on the verge to make the plunge.*

Interestingly, Figure 5.11 also shows that 30% of households surveyed would have purchased a unit at regular price, further illustrating customer satisfaction with the *Lumberlovers* composter. Customers were pleased with the quality of the bin and felt that they were getting their money's worth. The following are comments from participants that were supportive of the subsidy, and may have considered purchasing the bin at regular price after recognizing the true value of the bin and the service.

*Yes (would have bought composter at regular price) but it would have taken between 1-2 years for me to get it. \$25.00 is much more reasonable and accessible. Delivery, info, support and teaching as well as cost were important factors in me buying the composter.*

*Appealing price. I would pay \$75.00 now that I have a composter and see the value in it. The \$25.00 composter definitely made it more attractive.*

Another customer indicated that he would pay the full amount if it were tax deductible,

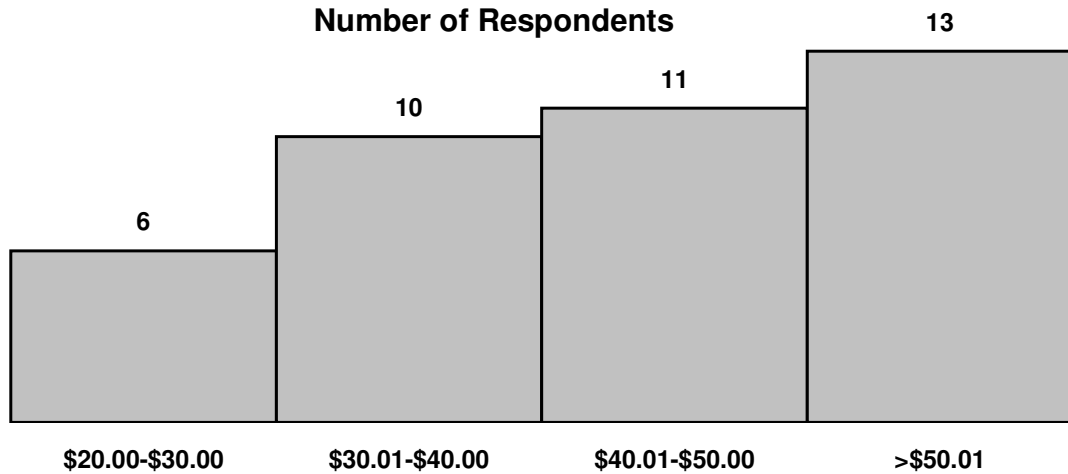
*Would pay \$25.00 but if tax deductible \$75.00 would not be a problem. (Subsidy is) very proactive of the government and I give them full marks for a meaningful effort... should make full price of bin purchase tax deductible.*

Another participant, who was an experienced carpenter, felt that the materials alone were worth the \$25.00 price tag and commented, "If I was building it for a sale it would be \$50.00-\$75.00."

Participants provided input to the amount they would be willing to pay for the composter if the subsidy was not available. Figure 5.12 provides the results of the responses. Six participants were in the \$20.00 – \$30.00 range, ten in the \$30.00 - 40.00 range, eleven in the \$40.00 – \$50.00, and thirteen participants that said they would have paid regular price



for the bin. The average price customer was willing to pay for a *Lumberlovers* composter was approximately \$50.00.



**FIGURE 5.12 RANGE OF PRICES RESPONDENTS WILLING TO PAY FOR BIN**

Only one respondent provided comments against long-term subsidy programs. This customer writes,

*On going subsidy is not sustainable, need to find lower cost way of producing units for sale, City needs to provide curb side pickups or year round depots.*

### **5.2.9 CUSTOMER RECOMMENDATIONS FOR PROGRAM**

The households surveyed provided notable recommendations for the program. The most common suggestion was to continue the subsidy and delivery program with a broader scope to include all residents. Many also recommended increasing the amount of advertising and promotion for the program. Another customer recommended targeting new residential areas, apartment complexes, condominiums and co-op housing. During the interview she discussed the idea of promoting composting with housing development

companies, real estate agencies, and the Manitoba Home Building Association. Her thoughts were to have the cost of a composter, set up and education included with the cost of buying a new home. This would provide a convenient service for new homeowners and encourage them to start composting. Having this service available could also reduce the inconvenience for residents who compost and end up stopping because of a change in address.

Other interesting ideas included:

- Providing tax refund for full cost of composter;
- Targeting youth education and promotion of composting; and
- Using utility/water bill inserts to promote community composting programs and subsidies.

#### **5.2.10 COMPOSTING INFORMATIONAL SOURCES CONTACTED BY RESPONDENTS**

Customers were asked what (if any) source of additional composting information they had contacted after receiving a bin. A majority of respondents (73%) had not contacted any of the composting information sources available to them at the time of the survey. Ten percent had contacted the City of Winnipeg, 9% contacted the Compost Information Hotline, and 8% had referred to other sources of information such as books, the Internet and talking with their peers. Reasons may include:

- Reluctance to call and ask for help,
- Not aware of the services available,
- Customer did not experience serious enough problems that would force them to call for help; and

- Problems experienced and questions were solved by reading their composting information booklet, researching other composting books or Internet resources and asking peers for help.

#### **5.2.11 HOME COMPOSTING PERCEPTIONS AND BARRIERS TO COMPOSTING BEHAVIOUR**

The composter home delivery program was designed to address barriers and negative perceptions that hinder many residents from participating in home composting activities. The barriers reflected include lack of awareness of composting, economic cost of purchasing a composter, inconvenience and lack of motivation to purchase and set-up a composter, inconvenience of performing composting tasks and lack of composting knowledge including how to start and troubleshooting information. These barriers were addressed by the following program components: subsidized price, home delivery, demonstration, setup, and composting information booklet.

The purpose of question seventeen, “Using the following five-point scale where “one” is “strongly disagree” and “five” is “strongly agree”, please respond to the following statements based on your current knowledge and experience with composting,” was to identify any lingering negative perceptions towards composting that might oppose long term composting behaviour. The households surveyed experienced very few serious problems with the bin and composting. The positive composting experiences are reflected in the results, as most of the respondents did not agree with the common negative perception statements related to composting.

For example, a majority of respondents (84%) did not agree with the statements: “It is Inconvenient to Put Yard Waste in the Composter” (64% - “Strongly Disagree”, 20% - “Disagree”) and “The Cost of a Composter Prevents me from Composting” (45% - “Strongly Disagree”, 39% - “Disagree”). The results of the yard waste statement are understandable as the design of the composter makes this task more convenient. Some customers interviewed commented on how putting leaves and grass clippings to the bin was easier than bagging them and bringing them to the curbside. The results of the cost related statement were also expected as respondents generally thought that \$25.00 was a reasonable investment to make for a quality composter.

Respondents also disagreed with the following barrier statements to a lesser degree. Approximately 70% disagreed with the statements: “It is Inconvenient to Separate and Store Kitchen Waste” (Strongly Disagree 39%; Disagree - 32%; Agree - 20%; Strongly Agree - 5%) and “It is Inconvenient to take Kitchen Waste to the Composter (70% Disagree: 36% Strongly Disagree 34%; Agree – 21%: 16% Agree; 5% Strongly Agree). The inconvenience of separating kitchen waste is a task that several of the beginner composters interviewed said took some getting used to. Fifty percent of respondents also disagreed with the statement “It is Too Cold to Compost During the Winter (27% Strongly Disagree, 23% Disagree, Agree 9%, Strongly Agree 11%).

For the statements, “Composting will Attract Rodents” (25% Strongly Disagree, 19% Disagree, 30% Neutral, 5% Agree, 0% Strongly Agree, 22% Don’t Know), “Composting

will Attract Flies” (16% Strongly Disagree, 20% Disagree, 25% Neutral, 5% Agree, 0% Strongly Agree, 32% Don’t Know, 2% No Answer) and “Compost Takes too Long to Break Down” (16% Strongly Disagree, 25% Disagree, 18% Neutral, 20% Agree, 2% Strongly Agree, 18% Don’t Know) the results were split amongst those that disagreed with the statements because they had not experienced any problems, those that believed these were issues that would eventually come up and those that were neutral or did not know if these were going to be problems. With only five to six months and two seasonal climates for the evaluation period, it is understandable that respondents would remain sceptical of these potential problems that may be more of an issue in the future.

#### **5.2.12 WASTE DIVERSION POTENTIAL**

In calculating the waste diverted by the composter delivery program, there were important factors to consider. With increased commitment towards education, training on proper composting techniques and follow-up, higher participation rates and efficiency rates can be expected. The size of the composter (nearly three times larger than typical plastic models) should also dramatically increase the capture rate of compostable material. Finally, the wood used to manufacture each composter is 100% recycled and from local sources. The pallets used to manufacture the composters were being sent to the landfill prior to *Lumberlovers* wood recycling operations. Thus to estimate waste diversion potential, the weight of materials used to manufacture the bins (approximately 50 kilograms/bin) is combined with the estimated amount of organic materials diverted. The 160 distributed bins diverted an estimated fifteen tonnes of organic material and wood waste during the first year of use and has the potential to divert over seven tonnes

of household organic material annually. That calculates to approximately 78 tonnes of organics over a ten-year lifespan or approximately 49 kilograms of organics diverted by each bin a year.

### **5.2.13 LANDFILL COSTS AVOIDED**

The delivery program, with an operating cost of \$5, 000, averaged a much higher cost per tonne diverted (\$52.03/tonne) due to the fact that the amount of government subsidy per bin was much greater (31.25 per bin versus \$4.80/bin). Nonetheless, the project does result in average annual cost savings of \$264/yr and total savings of \$506 (after breaking even in year eleven) throughout the twelve-year lifespan of a bin.

**TABLE 5.2 WASTE REDUCTION POTENTIAL OF HOME DELIVERY BIN SALE**

<b>NBD</b> 160 BINS	<b>Estimated Food Waste Diverted</b>	<b>HIGH END</b>	
		$= (160) \times (0.93) \times (68.9 \text{ kg}) \times (0.605) \times (100\%)$ $= 6203 \text{ kg/yr}$	
		<b>Low End</b>	
		$= (160) \times (0.90) \times (68.9 \text{ kg}) \times (0.605) \times (100\%)$ $= 6002 \text{ kg/yr}$	
<b>UR</b> Short Term = 93%  Long Term = 90% (Assumption)	<b>Estimated Yard Waste Diverted</b>	<b>High End</b>	
		$= (160 \text{ Bins}) \times (0.93) \times (11.4 \text{ kg}) \times (.845) \times (0.85)$ $= 1218 \text{ kg}$	
	<b>Estimated Wood Waste Diverted</b>	<b>Low End</b>	
$= (160 \text{ Bins}) \times (0.90) \times (11.4 \text{ kg}) \times (.845) \times (0.85)$ $= 1179 \text{ kg/yr}$			
<b>ER</b> Assume 100% Composter Efficiency Rate For Compostable Food Waste  Assume 85% Composter Efficiency For Yard Waste	<b>Estimated Total Waste Diverted</b>	<b>High End</b>	
		$1^{\text{st}} \text{ Year} = \text{Food} + \text{Yard} + \text{Wood Waste Diverted}$ $= 6203 + 1218 + 7272$ $= 14\,693 \text{ Kg} = 14.7 \text{ Tonnes}$	
		Annual Diversion After 1 <sup>st</sup> Year = 7.4 Tonnes	
		<b>Low End</b>	
		$1^{\text{st}} \text{ Year} = \text{Food} + \text{Yard} + \text{Wood Waste Diverted}$ $= 6002 + 1179 + 7272$ $= 14\,453 \text{ Kg} = 14.5 \text{ Tonnes}$	
		Annual Diversion After 1 <sup>st</sup> Year = 7.2 Tonnes	
<b>Average Waste Diversion from Each Bin Distributed</b>		$(7800 \text{ kg/yr}) / (160 \text{ Bins}) = 48.75 \text{ kg/yr}$	

**TABLE 5.3 POTENTIAL COST SAVINGS FROM DELIVERY PROGRAM**

<b>COMPOSTER DELIVERY PROGRAM</b>	
<b>TOTAL COST OF PROGRAM</b>	\$5 000
<b>Lifespan of Bin</b>	10-12 years
<b>Total Diversion During Bin Lifespan</b>	= 14.7 t + (7.4 t)X(11yr) = 96.1 tonnes
<b>COST/TONNE DIVERTED:</b>	=[\$5 000/(96.1 TONNES)]  = \$52.03/tonne
<b>Avoided Costs Per Year</b>	1 <sup>st</sup> Year = (*70.00 – 52.03)/t X 14.7t/yr = \$264/yr Following Years = (*70.00 – 5.40**) X 7.4 t/yr = \$478/yr
<b>Total Avoided Costs</b>	= \$264 + (\$478 X 11yr) = \$5522
<b>Years to Break Even</b>	= Total cost of Program/Average savings/yr = \$5 000/\$460/yr = 10.9 yrs
<b>Total Cost Savings</b>	= Savings Years X Average Savings/yr = 1.1 yrs X \$460/yr = \$506
<b>Government Subsidy</b>	\$31.25/Bin
<b>Gross Earning Potential for Manufacturer</b>	= (25.00 + 25.00) X 160 + \$400 (transportation funding) = \$8 400

### **5.3 WHAT DOES IT ALL MEAN? DISCUSSING THE FINDINGS FROM THE BIN DELIVERY PROGRAM CASE STUDY**

#### **5.3.1 HOME DELIVERY PROGRAM**

The experience of delivering the composters resulted in several important findings. First, the assumption that delivery was a necessary service proved to be correct, as few residents would have been able to pick up this particular composter on their own. The



*Lumberlovers* composter does not fit in compact vehicles and requires a large vehicle (pickup truck or van without seats) to be transported. The considerable size and weight of the composter would have also prevented several customers with physical limitations from being able to transport the unit.

With a better understanding of the vehicle and fuel expenses and the amount of work required to deliver the composters, it was clear that there was not enough funding and resources allocated toward this important service. Delivering all 160 composters required Mr. Murphy and the researcher to essentially volunteer their labour. In order for this approach to be viable, delivery expenses of approximately \$7.00-\$10.00 for each bin would need to be integrated into the initial budget or charged to the customer. Considering the time spent with each customer, it is certainly reasonable to have the customer pay full or partial costs of delivery expenses. These are options that should have been discussed more thoroughly prior to the launch of the program. The researcher was fortunate that vehicles large enough to transport multiple bins were available. This was a cost not accounted for in the project budget.

The manufacturing process would need to be improved if this program were to be expanded and offered to a wider range of residents. At the time of the project, the personnel for *Lumberlovers* consisted of one full-time worker (Mr. Murphy) and one part-time worker who had left before the project was completed. This severely limited the rate at which composters were constructed. Finding a steady source of recycled wood for constructing the bins was also a challenge, particularly because *Lumberlovers* had

never completed an order of this magnitude before. Over the years, *Lumberlovers* had stockpiled a large supply of quality recycled wood that was used up for the order. Although the material was free, there are significant labour costs associated with salvaging the wood, which involves harvesting usable pieces, de-nailing and transporting the material. Mr. Murphy has been in negotiations with the City of Winnipeg to relocate *Lumberlovers* to Brady Landfill. The proposed wood recycling operation would enable *Lumberlovers* to have a steady source of reusable wood and essentially eliminate cost of transporting materials to a work site (*Lumberlovers* would have access to wood that is sent to the landfill). This wood recycling operation would have alleviated many of the problems experienced during the bin delivery program. It could also help offset manufacturing costs and reduce the price of the bin.

The promotional campaign generated more than enough orders from Winnipeg residents and also attracted interest from rural communities, local businesses and community groups. There were ten residents who did not receive composters but did request more information about composting and the *Lumberlovers* product. Six of these contacts had actually purchased the *Earthmachine* bin from the City of Winnipeg. Two email inquiries came from outside Winnipeg (Brandon and Pinawa) with both customers asking why the bins were not being offered in their towns. RCM was asked to do a composting workshop in Pinawa after forwarding the email to their office. Additional activities could have been used to promote the project such as sending a press release to the Winnipeg Sun or Winnipeg Free Press, radio or television spots and interviews, more display tables in other locations of the City. Considering the limited budget, resources and available

staff, the campaign was effective in achieving the first priority, raising enough customer interest to ensure all 160 composters were sold.

There were significant observations made while conducting the deliveries. First, was witnessing how important aesthetics are to customers. Nearly all the customers were genuinely pleased with the appearance, size and design of the composter that they were receiving. However, the experience of dealing with the few unhappy customers was enough evidence to show that personal preferences will dictate the type of composter a person will want to buy. A bin distribution program that features only one product will not be able to satisfy the needs and preferences of all residents.

During deliveries, observations were made related to the importance of bin size and available yard space. Two customers that were interested in purchasing a composter declined after seeing the size of the bin and realizing that their yards would not be able to hold such a large composter. Both customers were located in the Wolsely area where yard space is often limited. With the varying sizes of backyards throughout Winnipeg it is conceivable that many households would not have enough room for a bin of this magnitude. Again, these situations showed that there is no single composter model that will satisfy every person's needs or personal preferences. Providing different unit options should help to ensure greater customer satisfaction and increase the chances that customers will compost.

Delivering composters to diverse areas in the City, provided insight to the amounts of yard waste produced by various neighbourhoods. Several deliveries were made to residential areas such as St. Vital, St. James, Charleswood and Lindenwoods with enormous yards producing high amounts of yard waste grass clippings waste. There were also deliveries made in older neighbourhoods such as River Heights and St. Boniface where leaf waste is prevalent. In witnessing households produce up to ten to twenty bags of yard waste during the fall and spring months, one cannot help but be concerned for the amount of energy and resources that are wasted in sending these compostable materials to landfills. With relatively few municipal waste reduction programs in place in Winnipeg that target yard waste, this is an area that certainly needs to be addressed at the very least through home composting, grasscycling measures and increased promotion of the Leaf it With Us program.



**PHOTOGRAPH 5.23  
SOMEONE NEEDS A COMPOSTER**

During the demonstrations with residents that were producing high amounts of yard waste, the researcher emphasized that the compost bin should not be overloaded with

leaves and grass clippings. Customers were advised to save a supply of leaves and grass clippings throughout the year, layering brown (yard waste) and green (kitchen waste) material. Grasscycling was also recommended to minimize the amount of grass clipping waste. Taking these measures would aid customers to compost as much of their yard waste as possible. However, if organic waste is to be eliminated from the waste stream in these areas, a single composter even the size of the *Lumberlovers* unit may not be enough. Providing multiple units for these customers would certainly help matters. However, an integrated approach that includes increased education and incentives for residences to grass cycle and mulch leaf waste would alleviate much of the pressure on bins and the City's garbage services to handle all of this material.

Completing the delivery portion of the project, was a significant achievement in itself. A total of 160 composters were delivered to homeowners in Winnipeg and a few households on the outskirts of Winnipeg. These residents each received information on how to properly use their composter with information booklets, demonstration of how to use the bin and tips on how to get started. Data was collected from initial contact with customers. The deliveries provided an opportunity to establish a relationship with the participants who in turn would provide valuable feedback regarding the composter, the pilot program, their personal experiences and opinions. These participants can continue to provide useful information regarding the short-term and long-term impacts of the composter delivery program and the methods utilized.

### **5.3.2 “ROT-TO-YOUR-DOOR” ATTRACTS CUSTOMERS WITH VARYING LEVELS OF COMPOSTING EXPERIENCE**

One of the primary objectives of the project was to see if the methods employed with this bin distribution program (promotion, advertisements, education, delivery and bin subsidy) would be effective in encouraging households that were not composting to start. With a limited number of bins, there was a concerted effort to provide bins only to customers that had were not currently composting and had little to no prior experience. During the early stages of the program there were several bin requests from customers that were not ideal subjects, i.e. they were currently composting and would not require much incentive to continue composting. There was however, concern that the bins would not sell out. Time constraints inevitably forced the researcher to distribute bins to customers that were composting prior to the sale.

The results of the surveys have shown that customers with varying levels of composting experience will be attracted to the sale. Customers that requested a composter typically fell into one of the following categories: those that are not composting, have no prior experience and want to try it; customers that are not currently composting but have composted before and want to do it again (these customer may have been unsuccessful with composting before but want to do it properly this time); and customers that are currently composting, have had positive experiences, and want to upgrade their current bin or increase the amount they are composting. With respect to these levels of experience, extensive demonstration time may not be necessary for customers that are “well-versed” in home composting techniques.

### **5.3.3 COMBINATION OF FACTORS MOTIVATED BIN PURCHASE**

There was a combination of factors that influenced respondents' to purchase a bin and to start composting. Environmental benefits of composting, personal satisfaction of helping the environment, and the affordable price of the bin were the primary factors in purchasing the bin and participating in the program. Customer friendly services provided by the program such as: how-to demonstrations, information booklet, and having the bin delivered and set up were attractive to respondents especially for those without a vehicle. These factors should all be considered with respect to developing an effective bin distribution program.

### **5.3.4 EVALUATING THE COMPOSTER DELIVERY PROGRAM**

Customer satisfaction with the *Lumberlovers* bin, the composting information booklet, the home delivery approach to distribution and the subsidized price were assessed. Feedback from customers regarding the program and various components has been phenomenal. The subsidy, delivery and educational services have garnered positive feedback from respondents, who feel strongly that these components should be continued, expanded and available for all citizens. The *Lumberlovers* composter and information booklet have also received high customer satisfaction levels. Customers felt the information booklet provided an effective reference tool to keep on hand for questions and composting tips. A majority of customers surveyed were very satisfied with the bin, commenting on how the bin's design and size made it convenient to compost. Some customers even commented that after using the bin and realizing its value, they would have considered purchasing one at full price. The fact that the bin was

made out of recycled wood was also an impressive selling point noted by customers. Customers were genuinely happy to have participated in the program, many expressing their gratitude and commenting on how they would not be composting had the bin sale delivery program not been available. The strong supporting comments from customers reflect the overall level of customer satisfaction with the program. The level of convenience, the quality of the composter and providing effective education were program components that have helped limit user problems.

### **5.3.5 RESPONDENTS USING BINS, COMPOSTING KITCHEN AND YARD WASTE**

Perhaps the best indicators of how effective the bin delivery program was were the high usage rates of respondents and the fact that few respondents experienced severe problems while using the bins. Of the 44 customers surveyed, 41 (93%) have started to use their composter within the first six months. Twenty of these respondents participated in home visits/interviews, which provided visual confirmation that they had started to use their bins. Home visits also demonstrated that these customers were effectively using composting tips provided during the composting demonstrations such as composting kitchen and yard waste, utilizing a container to collect organics in the kitchen, storing leaves next to the composter to have a steady source of brown material, and having a collection bin to store organics outside during the winter. The percentage of respondents composting both yard and kitchen waste was also encouraging, as effective composting requires a balance between greens (nitrogen-rich kitchen material) and browns (carbon rich material such as dried leaves and dried grass). There was however, a noticeable gap between the number of respondents that were composting leaf waste (86%) compared to



those composting grass clippings and garden trimmings (70.5%). This can be attributed to bins being delivered during fall months and the surveys occurring in the spring. Many customers had yet to cut their grass before the survey was administered. Nearly 7% of respondents said they had yet to start composting garden trimmings and grass clippings. It is likely that if surveys had been administered a full year after delivery, giving respondents an opportunity to compost during the summer, the percentage of customers composting leaf and grass waste would have been closer.

Although measures were not included to evaluate how well each customer was composting, feedback indicates that a majority of households surveyed are composting correctly, experienced few serious problems, and composting both kitchen and yard waste. The most severe problems experienced by customers had more to do with external factors than the actual composter. These included winter weather, moving to another house and doing household renovations.

Comments and opinions expressed by respondents indicate strong support for bin subsidies and providing economic incentives to encourage more citizens to home compost. The results also indicated that without the subsidy many customers would have been unable or unwilling to purchase a bin and participate in the program. The overall package offered: the composter, delivery, and education was definitely worth much more than the \$25.00 charged to the customer. According to respondent feedback (and depending on the economic situation of a household) \$30.00 – 40.00 appears to be a reasonable price to pay for a bin like the *Lumberlovers* model to be delivered to a

resident's backyard. Respondent feedback also indicated that the bin rate of uptake and overall sales would have been hindered had the composters been offered for anything greater than \$50.00. Many participants, especially those with little or no previous composting experience probably would not have been willing to make that kind of a financial investment for a composter. Meanwhile, these results also indicate that the regular price of high quality composters can be prohibitive and can discourage the average homeowner to buy one. Local bin producers such as *Lumberlovers* should look at improving construction methods to minimize manufacturing costs (while maintaining sustainable profits) in order for bins to be offered to the public at a lower price. Perhaps in this case, government grants can be used to subsidize manufacturing costs for a business such as *Lumberlovers*, which recycles waste material to manufacture a product beneficial to the environment and community.

### **5.3.6 ESTIMATED WASTE DIVERTED AND COMMUNITY BENEFITS FURTHER DEMONSTRATE VALUE OF BIN DELIVERY PROGRAM**

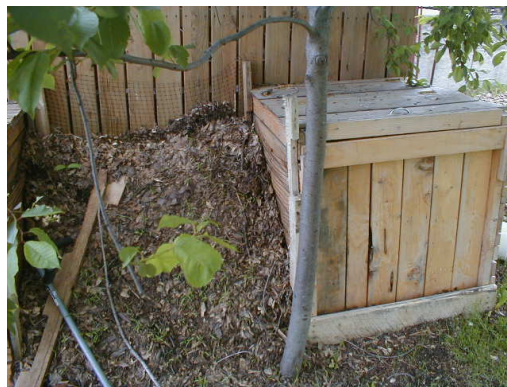
The bin delivery program offered important contributions to residential waste diversion rates. Based on the results of the surveys and Winnipeg waste composition figures, the bins sold had the potential to divert an estimated fifteen tonnes of organic material and wood waste during the first year of use and has the potential to divert over seven tonnes of household organic material annually. That calculates to approximately 78 tonnes of organics over a ten-year lifespan or approximately 49 kilograms of organics diverted by each bin a year a substantial number considering the size of the project (160 customers). Estimated cost savings from the program were not as favourable as the per bin subsidy

diminished money saved from diverting household organics from garbage pickup and landfills. The waste diverted does, however, translate to significant reductions in greenhouse gases from methane producing organic materials diverted from the landfill and reduced fuel consumed by garbage trucks.

Although difficult to quantify, it is important to discuss the significant community benefits that have resulted from the program. Increased environmental awareness & education of participants, especially those participants that were new to home composting, was a substantial benefit. All 160 participants received personal instructions and education on composting. A number of respondents also were impressed and surprised at how little waste they were producing with their combined efforts to compost and recycle. Some had involved their children and recommended the composting program and bin to family and peers. Customers with positive composting experiences can certainly be an effective and low-cost method of promoting composting. It would also be interesting to gather their current opinions about garbage levies now that they have witnessed the impacts composting can have on their waste output.

Promotion from the bin sale has also led to other worthwhile waste diversion projects. For example, the bin sale triggered the St. John's College Food Waste Composting Program and Demonstration Site. The program, which began in June of 2003, involves composting of food waste from the kitchen; features a three-bin *Lumberlovers* composter; and has resulted in nearly 1000 kilograms of waste diverted. The promotional campaign also led to the initial discussions to start a composting program for the Oblates Sisters

Missionary in St. Boniface. Other noteworthy contacts were made with the Sturgeon Creek Neighbourhood Association and Elmwood Collegiate. The promotional campaign generated more than enough orders from Winnipeg residents and also attracted interest from rural communities, local businesses and community groups. RCM was also asked to do a composting workshop in Pinawa after news of the composter delivery program was forwarded to a Pinawa government worker. Finally, since the project ended in January 2003, *Lumberlovers* has already been involved in two subsidized bin distribution programs involving the Spence Neighbourhood Association and Manitoba Conservation (Murphy 2003).



**PHOTOGRAPH 5.24 ST. JOHN'S COLLEGE COMPOSTING DEMONSTRATION SITE**

### **5.3.7 ADDITIONAL FACTORS FOR SUCCESS: PERSONAL INTERACTION, COMMUNITY EXPERTS, COMMITMENT**

Additional program components have contributed to the high participation and bin usage rates as well as the positive feedback from respondents. First, there was a strong emphasis on personal interaction. For example, participants were engaged in conversations to gain background to their composting knowledge and experience, and answer any questions they may have had about composting. During the deliveries, time was taken to demonstrate proper composting techniques and how to avoid potential problems. Finally, conducting follow-up was another opportunity to communicate with participants and provide positive reinforcement for their actions. According to McKenzie-Mohr and Smith (1999), approaches that emphasize personal contact to promote sustainable behaviour have a higher likelihood of success and long-term sustainability.

*Research on persuasion documents that the major influence upon our attitudes and behaviour is not the media, but rather the people with whom we interact. (For greater success) create opportunities for people to talk to one another through programs such as block leaders, in which individuals who already have experience in a sustainable activity, such as composting, speak to others from their neighbourhood. (McKenzie-Mohr and Smith 1999)*

Although time consuming and potentially costly if utilizing paid staff, participants surveyed appreciated the personal interactions and this is demonstrated in the results.

Another crucial element of the project was the involvement of Murphy and the researcher, both community members knowledgeable about composting. Having deliveries conducted by people who know how to compost made it easier for customers to have their questions answered and to ease the minds of participants who have never

composted before. Both were extremely enthusiastic about composting, sharing the attitude that all citizens should be composting. Having enthusiastic community members deliver the message can also increase the likelihood residents will adopt composting. This is emphasized by McKenzie-Mohr & Smith (1999) who argue that making use of block leaders or community volunteers can dramatically enhance the positive impacts of an environmental education program. This is also demonstrated by the effectiveness of Master Composter programs that utilize community volunteers to educate peers and model composting behaviour.

Commitment was another tool used to enhance bin usage and participation rates. Commitment techniques, according to McKenzie-Mohr & Smith (1999), “have shown to be effective in promoting a variety of behaviours.... Including sustainable behaviour”. During the initial contact, it was communicated to the customers that there would be certain expectations and a level of commitment required from if they were to receive a subsidized composter. Each customer was also informed that a follow-up call was to be expected from the researcher to see if they were using the bin and to gain feedback about the program. By simply informing customers of the follow-up and having customers expect a telephone call, a significant level of commitment was achieved that most likely had positive impacts on participation rates. Other tools that could be used to attain commitment include having customers state that they will start using their bin by a certain time period (written or verbally), or providing a sticker that can be placed on recycling bins that indicate that they compost (McKenzie-Mohr & Smith 1999). (Note that research guidelines restricted the use of written contracts with participants.)

### **5.3.8 IMPROVING THE COMPOSTER DELIVERY PROGRAM**

There were a number of ways that the bin sale delivery program could have been improved. For example, starting the bin sale delivery program in the springtime would have been more appropriate. Delivering composters during the spring and summer months would have been much easier. Receiving the bins during more favourable conditions, customers would also be more inclined to start using composters immediately.

A conscious effort was made to limit access to subsidized composters. Customers who were not composting prior to the sale were given priority. This limited orders as several incoming calls came from residents that from the City of Winnipeg. As well, a handful of customers that received a *Lumberlovers* composter mentioned that people they knew did not try to order a composter because of the requirements. Increasing accessibility and the number of bins available to all residents would be a priority to improve the program.

A number of changes would need to occur in order for this program to be feasible. First adjustments would have to be made to the price of each bin and the amount of funding provided. According to Murphy, at \$50.00/unit (where customer paid \$25.00 and subsidy covered \$25.00), the bins were being sold below cost, making it difficult for his business to stay afloat. The significant costs associated with delivery and setup also was not reflected in the subsidy or in the price of the bins. Results of the follow-up surveys from the City of Winnipeg and *Lumberlovers* bin sale also hint that customers would be willing to pay more for a high quality wood composter. One can also argue that

considering the greater durability, size, capacity (triple the capacity) and waste diversion potential of the *Lumberlovers* composter (also diverting approximately a hundred pounds of wood waste), they are worth more than the *Earthmachine* bins and garner a higher price or larger subsidy. A charge of \$40.00 would be a reasonable price that customers would be willing to pay for this particular composter. A nominal delivery fee of \$5.00-10.00 for customers that require delivery should also be included to cover transportation costs. If the prices were any higher, it would be extremely difficult to sell composters at the same rate in such a short time span, especially among residents with little or no composting experience. Allowances should be given for lower income households and neighbourhoods. For example, the *Lumberlovers* composters were being offered for (\$5.00 thanks to a civic grant from Harvey Smith) to the Spence Neighbourhood district (Murphy 2003). Additional funding and grants could also be applied for and allocated towards program components such as composting education, demonstration and promotion; employing additional staff (for bin construction, deliveries, composting educators, and program coordinator) and delivery costs.

More effort and resources would also need to be allocated to promotion and advertising campaigns, especially towards low cost promotional activities such as press releases, radio and television spots, and community displays. *Lumberlovers* operations would have to become more efficient as there were lengthy waiting periods for many customers due to manufacturing delays and shortages in wood supply. Providing custom-made bins to fit smaller yards and to install components that improve convenience should also be explored.



Another recommendation to improve the program would be to design a poster or placard with illustrative instructions on how and what to compost and provide this for each customer. This poster could be posted in a visible location in the kitchen or near the composter and would accompany the information booklet and would provide customers with the basic information necessary to start composting. Finally, tools such as thank-you letters, news articles or advertisements that communicate follow-up results to participants and provide positive reinforcement for their actions would be incorporated into the program.

### **5.3.9 FUTURE RESEARCH OPPORTUNITIES**

Although determining early rates of usage is important, it is premature to assume that those respondents found to be composting will continue to do so for years to come. Long-term participation rates of bin sale customers are expected to drop and further studies would be beneficial in determining the lasting impacts of the composter delivery program. Meanwhile, no respondents had harvested or made use of finished compost material, indicating that there may not have been enough time allocated between purchase day and the survey day to produce finished compost. Follow-up studies conducted within five and ten years of the sale would help to alleviate these data gaps and provide valuable information regarding the bin delivery program's effectiveness in encouraging residents to adopt composting in their lifestyle, long-term composter use and the durability of the *Lumberlovers* bin.

The home visits allowed visual confirmation that composters were being used. However, interviews were not used to measure the amount of material composted. Waste diversion estimates relied predominantly on the Winnipeg waste composition figures, which may have understated the amount participants were composting. A more accurate measure could involve a random selection of participants; requesting participants to weigh or estimate the volume of organic material composted for a set time period; and calculating a group diversion rate based on the sample data.

An additional tool that could be used to improve follow-up analysis is an “effective use rating/scoring system”. This proposed system would involve participants being assessed based on survey responses and points given for “effective use” of their composters. This could include continued use of their bin, composting both kitchen and yard material, harvesting and application of finished material, rate of diversion, problems experienced and willingness to speak to peers about composting. Types of material composted and problems experienced while composting were assessed during this study. However, measuring the amount of material composted and a customer’s willingness to speak to peers about composting were areas not covered. Past programs and composting studies have also developed composter usage indices that rate how effectively a household is composting.

#### **5.4 THE VERDICT ON “ROT TO YOUR DOOR” PROGRAM**

Composter bin subsidy and distribution programs are important tools to promote home composting in a community. The composter delivery program incorporated a

“community” focus, partnering with local entrepreneurs to manufacture the composter, and providing participants with convenient services such as delivery, setup and demonstration. Despite several setbacks during the manufacturing and delivery processes, the challenging task of distributing 160 recycled wood composters throughout the City was completed. All the available composters were sold despite a limited advertising and promotional campaign. As well, 160 residents received personal instructions and education on composting. The results of the follow-up surveys indicate high participation and customer satisfaction rates that reflect well on the combination of offering a high quality wood composter at low-cost, delivering bins door-to-door, and providing installation and demonstration. Although the project was small in terms of the number of bins distributed, the impacts in terms of waste diverted/participant; environmental awareness and community benefits noteworthy. The strong focus on personal interaction with customers and enthusiasm for composting conveyed by the program coordinators have also been crucial elements to the success of the program.

Despite these benefits and based on the price and funding allocated to the pilot project, the program would not be feasible on a large scale where bins are delivered to the entire population in a city the size of Winnipeg. A small to medium scale program, providing composters to a few hundred households from spring to early fall months would, appear to be a more realistic endeavour through this approach. Even at this level however, additional funding and revenue would be required to cover the cost of bin delivery, setup and demonstration. Sources of additional revenue could include higher subsidized bin prices (\$30.00-\$40.00); delivery and set-up charge would help offset these costs and

would likely not deter customer interest. Government funding may be better allocated towards subsidizing the cost of producing the bins, and recycling the wood supply required to manufacture them. This type of cyclical production is a valuable practice that should be encouraged and modelled. Although formidable, these challenges should not undermine the value of the project and the potential for future programs that feature similar components of education, customer service, and high levels of personal interaction to succeed.

## **CHAPTER 6 SUMMARY AND COMPARISON OF SURVEY RESULTS AND BIN DISTRIBUTION PROGRAMS**

### **6.1 INTRODUCTION**

The research project involved two case studies: the City of Winnipeg truckload bin sale and the Rot-to-Your-Door bin delivery program. The results for each case results are discussed separately in Chapter 4 and 5. Chapter 6 compares the two case studies, discussing the commonalities, differences between programs, results, improvement needs and implications to home composting efforts in Winnipeg.

### **6.2 SUPPORTED BIN DISTRIBUTION PROGRAMS ATTRACT HOUSEHOLDS WITH VARYING LEVELS OF COMPOSTING EXPERIENCE**

A primary research objective was to assess how effective the bin sales were in encouraging households to start home composting, focusing especially on non-composting households. The participant's level of composting experience was also expected to influence bin usage and composting rates as households with prior knowledge and successful experiences are more likely to start using their newly purchased bin, as this is simply a matter of continuing their current composting practice with a new bin. Based on the results of the two case studies municipalities can expect supported bin distribution programs to attract customers with varying levels of composting experience. Most customers fell into one of the following categories: households with no previous experience; households with previous experience but were not currently composting; households that were currently composting without a compost

bin (vermi-composting, mulching, pile, grasscycling), customers composting with a different bin model. Customers that had composted previously (but were not currently composting) had stopped for a number of reasons such as having no prior success to composting; their bin being ineffective; and moving to a new house. Municipalities can also expect citizens with previous composting experience to take advantage of these high profile composting promotions. The two case studies revealed that customers with previous composting experience could range from 30-40%. Customers surveyed with previous experience often chose to purchase another bin to improve or upgrade their current composting system or to increase the amount that they were currently composting.

Having knowledge of a customer's composting experience prior to purchasing a bin can be very valuable in developing composting education programs and on-going support strategies that help to ensure high participation and efficiency goals are met. With a higher proportion of customers with little composting knowledge and experience, greater efforts need to be directed towards providing these customers with proper composting education, on-going customer support and follow-up to limit future composting problems, customer concerns and maximize bin use. For example, workshops, information sessions, demonstrations can be fashioned for beginners (participants that have just started to compost) to ensure they have proper composting information, feel comfortable to start composting and to avoid potential problems which may cause them to stop in the future.

### **6.3 AFFORDABLE PRICES AND HELPING ENVIRONMENT: STRONG MOTIVATING FACTORS**

The results of both surveys were similar revealing two primary motivations for purchasing: the environmental benefits of composting and the sale price of the bin. Important environmental benefits of composting included reduction in household waste, satisfaction from helping the environment and producing compost to improve soil conditions. The relevance of environmental benefits is certainly consistent with the literature as authors such as McKenzie-Mohr and Smith (1999) make reference to reducing household waste as a strong motivator for composting behaviour.

Affordability of the composters also played a major role in influencing customers to purchase a composter. The sentiment from respondents was that \$25.00 was an affordable price and a reasonable amount to invest in composting. The low cost provided a good incentive for households that were not composting and have wanted to compost for years, to actually start. The sale price also encouraged customers from both programs who had been composting for years to purchase a new bin to upgrade their current system or compost additional household organic waste.

### **6.4 PERSONAL ECONOMIC SAVINGS OF HOME COMPOSTING NOT A SIGNIFICANT MOTIVATOR**

Financial benefits of home composting includes saving money on store purchased fertilizers. The economic savings from home composting is often used as a selling point in promotional campaigns and composting literature. For example, McKenzie et al

(1995) suggests “some households may decide to compost due to the money saved by decreasing the need for store-bought fertilizers for their gardens.” Survey results, however, indicate that personal economic savings had little to do with respondents’ decision to purchase a bin. Speculation as to why respondents would not feel this was an important factor lead to the following points. The first was that inexperienced customers might not be aware of potential savings. However, to residents who do not purchase a substantial amount on fertilizers, financial savings would not be significant. One can argue that within a waste management system that allows residents to pay a flat rate to landfill their waste, household savings offer little incentives for residents to start composting. Without significant financial incentives to reduce household waste, municipalities are relying essentially on the intrinsic value of composting and the public desire to do what is right. It is expected that the onset of user fees for excess garbage bags will create financial incentive to reduce household waste through home composting (and recycling).

## **6.5 RESPONDENTS HAVE EXIBITED HIGH PARTICIPATION RATES**

The success of bin distribution programs in encouraging home composting lies with their ability to increase the composting convenience. According to McKenzie et al (1995) “composting convenience has two facets: the convenience of obtaining a compost unit and the perceived convenience of carrying out the ongoing activity of composting.” Bin sales are initiated to combat these convenience barriers by making it easier obtain a composter and selling units at a discounted price. The delivery program goes one step further by offering delivery and set up. A unit itself makes the routine of composting



more convenient by keeping the compost pile in a compact, contained pile, that organic material can be added to on a daily basis. The surveys were administered to customers to see if these tools have worked in encouraging high usage rates and limiting customer problems.

Survey results have been positive, first by demonstrating that residents who purchase a bin are likely to start using it. Of the 193 respondents from the City of Winnipeg survey, 170 or 88% claimed to have started to use their composter. A slightly higher UR was discovered with bin delivery participants. Forty-one out of the forty-four *Lumberlovers* customers (93%) had started to use their bin. Twenty of these respondents were confirmed during interview visits.

There are two points to discuss in considering bin participation rates from each respective case study. First, is that these short-term UR are consistent with the results from other bin distribution programs. For example, the City of Brandon, who conducted their own composter bin sale in 2001 found over 90% of units surveyed in use after one year (City of Brandon 2003). The Toronto Home Composting Study revealed that approximately 97% of the respondents had started using their composting units after a year (Maclaren 1990). Lastly, in measuring the success of the composting outreach and bin distribution program, researchers from Massachusetts found that 92% of the distributed bins in use and the majority of bin purchasers were satisfied with their compost bins (McGovern 1997).

Prior to conducting the follow-up analysis, the researcher predicted that higher participation rates would be found among the bin delivery customers. Although a higher rate was discovered with the bin delivery program, it was not significantly higher. From comparing these results it is possible to conclude that the method of obtaining a composter does not significantly impact participation rates. However, these represent short-term usage rates. It is still very early to determine whether customers will be composting for years to come especially for those customers that are experiencing composting for the first time. The impact of greater customer convenience and interactive educational techniques may still prove to be great if future studies are conducted, which look at long-term rates and effective composter use.

## **6.6 CUSTOMERS GIVE STAMP OF APPROVAL FOR SUBSIDIZATION PROGRAMS**

*The potential for building an environmentally sustainable economy by restructuring subsidies is enormous. The economics of shifting from destructive subsidies to constructive ones is as attractive as the logic is compelling. Today we should be subsidizing not mining but recycling, not fossil fuels but climate-benign energy sources, and not urban automobile dependency but state-of-the-art urban rail systems (Brown 2001).*

There were two survey outcomes that indicate strong customer approval of government bin subsidy programs. The first is the positive customer feedback for the bin sale initiatives. Respondent consensus was that government subsidization of home composting was a worthwhile endeavour, with respondents going as far as saying “the subsidy makes good use of taxpayer’s money”. The other indicator of customer approval and the effectiveness of the subsidy was that a majority of respondents said they would not have purchased a composter at regular price. Approximately 80% of the City of

Winnipeg customers said they would not have purchased the *Earthmachine* at regular price. Meanwhile, nearly 68% of the wood bin customers said they would not have purchased the bin without the subsidy. These results also suggest that the regular price of these composters may be prohibitive to residents either because they cannot afford it or they are not willing to make that high of an investment in a composter.

This coincides with studies that demonstrate the impact subsidizing the cost of a bin has on the uptake rate of composters. For example, when government subsidies in Durham, Ontario reduced the cost of a composter by 50% distribution increased from 1000-2000 units in the previous year to 16,000 units in the year in which bins were subsidized (McKenzie et al 1995). Metro Toronto's home composting program distributed 19,016 subsidized home composting units over the course of a year (Maclaren 1990). A total of 32,000 *Earthmachine* composters were distributed to residents in Portland, Oregon from 1994-1997 (Foseid 1998). Meanwhile, a free bin giveaway resulted in over 35,000 distributed to Waterloo residents from 1994-1996 (Gombos 1994). Although a majority of citizens agree with composting, most residents are unwilling to spend a lot of money to do it. For the *Lumberlovers*, *Earthmachine*, or any high quality composter to reach "widespread" use in Winnipeg, prices must continue to be low through lower manufacturer rates or continued financial support from the government level.

There is however, a counterpoint to the positive customer response to bin subsidies. These positive results are based on a rather biased survey sample. The research in effect asked those who directly benefited from the subsidy whether it should continue. One

would expect a majority of these customers to support an initiative that they have directly benefited from. These results are not representative of the entire Winnipeg population. Questions still remain as to whether citizens (specifically those who have not received a subsidized composter and do not currently compost) believe this initiative should continue and support the use of taxes to subsidize home composting. Even if citizen polls and surveys revealed negative opinions on subsidization of home composting, it does not hide the fact that the cost of unsustainable behaviour such as landfilling does not reflect the true costs or impacts to citizens. Winnipeg's current scene of civic bylaws and provincial regulations do little to encourage home composting or industrial stewardship. The terms "subsidy" and "taxes" often raises controversy among citizens especially if the environment is concerned. Perhaps if more citizens realized the amount of subsidization that supports wasteful behaviour by residents and industry, there would be fewer barriers to restructuring government taxes and subsidization schemes into constructive systems that protect the environment and encourage sustainable behaviour.

#### **6.7 *EARTHMACHINE VERSUS LUMBERLOVERS: WAS THERE A CLEAR WINNER?***

Large discrepancy in sample sizes between the survey groups, and the fact that customers did not actually compare the units, are factors that make it difficult to award an undisputed winner between the two composting units studied. Data analysis, observations made during the deliveries, and personal experience with using the bins, have however, helped formulate some preliminary conclusions about the bins. Each bin

achieved high satisfaction rates. However, there are clear advantages and disadvantages to using each bin. Table 6.1 summarizes the advantages and disadvantages to each unit.

For instance, the *Earthmachine* is lightweight, easy to move and compact taking up very little space in a yard. It is easy to set up and use which explains the high customer satisfaction rate with over 90% of respondents saying they were satisfied to very satisfied with their bin. The black color attracts the sun to generate more heat. As well, the circular design prevents corners from drying out, which can occur with box shaped composters. Although customer-cited problems with the bin were not severe, the feedback helped to outline disadvantages to using the *Earthmachine*. Lack of capacity was evident, especially for households producing larger amounts of kitchen and yard waste. Several customers commented on requiring an additional composter or a larger bin to satisfy their needs. The size of the bin and the access to compost piles proved to be an inconvenience to customers especially when trying to add grass clippings and leaves, mixing the pile and harvesting finished material.



**PHOTOGRAPH 6.1 EARTH MACHINE IN USE**

In contrast, *Lumberlovers* customers had few problems related to capacity and adding materials. The unit, which features nearly three times the capacity, a removable lid and front panel to make it easier to add material and turn the pile, was designed with these needs in mind. The user-friendly design features helped achieve a high satisfaction rate where all 44 respondents said they were satisfied to very satisfied. Greater capacity and more convenient access to the compost pile enable customers to compost a larger fraction of their yard and kitchen waste. Winter weather appears to be less of a hindrance to these participants compared with the City of Winnipeg composter sale. This can be attributed to the larger capacity of the bin, which allows customers to continue adding organics to the pile despite decreased biological activity. As well, the demonstrations and information booklet provided tips on how to compost during the winter such as having a secondary container to store kitchen scraps outside to limit trips to a composter located in the backyard, not having to mix the compost pile, and waiting until the spring to add brown material.

Thus, on a per composter basis, the *Lumberlovers* bin performs at a higher efficiency rate being capable of composting a larger fraction of household organic waste and nearly three times the amount of the *Earthmachine*. With each bin being sold for the same price, those purchasing *Lumberlovers* bin got the better deal especially if one includes the additional services of delivery, set-up and demonstration. This is also demonstrated with the average price each respondent were willing to pay for each composter. The results also hint to a higher respondent acceptance of the wood bin versus the plastic bin as several respondents were willing to pay more than \$25.00 for the wood bin. Deciding on

the price to charge customers for the bin was limited due to funding requirements (which restricted the price of the bin to be equal to the City of Winnipeg *Earthmachine* price tag). Respondents do however, appear willing to pay a higher price for a larger, sturdy, wood composter especially if it is delivered and comes with instructions.

The *Lumberlovers* unit however, is not without its disadvantages. Some customers would have been better off with a smaller, more compact unit. For instance, a resident from Wolsely decided not to purchase the bin because there was not enough room in her yard to fit the bin. The size of the bin may make it difficult to maintain the compost pile, especially for those with physical limitations. Filled to capacity, it is labour intensive to turn the pile and harvest material from the unit. Consequently, the size of the bin can be a tremendous attribute but can also restrict residents that lack available yard space or are not willing (or capable) of some physical labour. Personal preference and tastes was also a factor for bins. Although a majority of the customers were pleased with their composters, two customers were clearly not happy with the appearance of the bin. These customers complained adamantly about how much they disliked the appearance of the bin. One of these customers contacted the researcher the following day and asked to return the composter.



**PHOTOGRAPH 6.2**  
**SIZE MATTERS: LUMBERLOVERS BIN COMPOSTING MORE**  
**WASTE THAN THE GARDEN GOURMET**



**TABLE 6.1 COMPARISION OF THE EARTHACHINE AND LUMBERLOVERS UNITS**

<b>Model</b>	<b>Earthmachine</b>	<b>Lumberlovers</b>	<b>The Advantage Goes To...</b>
<b>Type &amp; Percent Recycled Content</b>	Recycled PVC	100% recycled lumber; local lumber sources	Lumberlovers - due to local source of manufacturing materials
<b>Lid Security</b>	twist top lid; Some difficulty with warping during cold temperature	Durable flip lid; Not attached; Some difficulty with swelling, warping during cold, wet conditions	As is -Earthmachine; Customers can add hinges and or lock to lumberlovers unit if security is a concern
<b>Resistance to Pests</b>	Plastic material; Ventilation slots are large enough to let in oxygen but keep out rodents; Fastens to the ground by twist pegs - for animal and wind control	Strong, durable wood material; Narrow ventilation slats; Offers good rodent for larger rodents, small rodent are capable of entering ventilation slats	Earthmachine
<b>Size/Capacity</b>	Approx. 300 Litres; Larger than most plastic units on the market; Smaller than recommended size for optimum composting conditions (RCM); Much less capacity for organic material and fills up quickly; Compact size; Takes up little space in yard; Suitable for small family producing moderate amounts of kitchen waste and little yard waste, with small backyards	Approximately 900 Litres; Capable of handling large amounts of kitchen waste and moderate amounts of yard waste; Minimum RCM recommended volume for optimum results; Takes up more space in backyard; Suitable for larger families producing large amounts of kitchen waste and moderate amounts yard waste and larger backyard	Lumberlovers - handles nearly 3 times amount of organic material; Many Earthmachine customers stated they could have used a much larger unit; Earthmachine is suitable for smaller households; residents with limited space in yard for a composter; Crucial factor to success, convenience for customers
<b>Ease of Transport</b>	Lightweight; Some difficulty with transporting (smaller cars - people with physical limitations)	Heavy; difficult to transport; Requires use of flatbed truck; Most customers would require delivery.	Earthmachine - more convenient to transport
<b>Moisture/Aeration</b>	Twist top lid allows you to control ventilation; Small air slats; Good moisture retention; Round shape prevents corners from drying out; Occasional watering required	Spaces between panels allows sufficient aeration; Design allows for more frequent turning; Corners tend to dry out requiring occasional watering	Draw
<b>Ease of Assembly</b>	Easy to assemble; Instructions included;	No assembly required	Slight advantage to Lumberlovers as bins come assembled

**TABLE 6.1 COMPARISION OF THE EARTHMACHINE AND LUMBERLOVERS UNITS**

<b>Model</b>	<b>Earthmachine</b>	<b>Lumberlovers</b>	<b>The Advantage Goes To...</b>
<b>Ease of Use/Access to Material</b>	Easy to add kitchen scraps; Difficult to add large amounts of yard waste; Smaller, more manageable pile to turn; Round design allows unit to be turned/lifted to access pile from any direction; Some customers found mixing difficult unless with aerator tool or lifting bin off pile; Difficult to access finished compost	Very easy to use; Easy to add kitchen scraps and yard waste; Bulkier material can be composted at bottom of the bin; Easy access to pile to mix, add water; Requires heavy lifting to turn a full bin; easier with an aerator tool	Lumberlovers - routine composting duties; adding material much easier, can choose ; However, more difficult to turn, customer may prefer slower "inactive composting" methods
<b>Composting Efficiency Local Waste Diversion Potential</b>	Better than most units; Black color for maximum solar heat retention; Single composter suitable for small family that generates moderate amounts of organic waste; Not as effective as Lumberlovers; Manufacturing uses recycled material; Product itself not diverting local organic waste;	Uses recycled material that would otherwise be sent to landfill; Each bin diverts approximately 45 kg of lumber for manufacturing; Larger capacity encourages higher rate of household organic waste diversion.	Lumberlovers - on a per bin basis the bin outperforms the Earthmachine
<b>Creates Local Employment/ benefit to local economy</b>	Revenue earned by Norseman Plastics; Has potential to create short-term employment through bin sales; Potential for greater community and economic benefit if greater efforts made for community involvement	Small local business; employing locally	Lumberlovers - local business creating revenue
<b>Other Factors</b>	Overpriced retail value; 10-year warranty; customers may prefer plastic model	Customers willing to pay more for a larger bin capable of composter more material; Better retail value; customers may prefer wood model	Lumberlovers better retail value if priced equally. Should be priced higher than Earthmachine; customers can choose between units that are priced fairly

### **6.7.1 IMPORTANT HOUSEHOLD FACTORS TO CONSIDER WHEN SELECTING A COMPOSTER**

Customer feedback also indicates that one composter model will not satisfy the needs or preferences of every resident. There are a number of household factors that should be considered by a customer in order to choose the most appropriate system. Municipalities should also consider these household factors before selecting bins for widespread distribution to community members.

Available yard space and the amount of organic waste generated are household factors that will determine which bin or system is most appropriate for a resident. Larger yards can accommodate bigger composters, while households with limited yard space will be restricted to smaller units or an indoor system. Households with larger families consuming a greater amount of fruit, vegetable and starch, are expected to produce greater amounts of compostable kitchen waste. The size of a person's yard as well as the size and number of trees would also factor into the amount of household organic waste production. Residents with larger yards would likely produce more grass clippings (which could be minimized by grasscycling). Older neighbourhoods such as Wolsely, St. Boniface and River Heights, contain mature trees that generate large amounts of leaf waste that is often too much for smaller units to handle. With this in mind, the *Lumberlovers* unit is best suited for households with average to above average yard space that can accommodate the girth of the unit and produce greater amounts of kitchen organics. The more compact *Earthmachine* is a better fit for households that generate moderate amounts of organic waste and have limited space in their yards.

The time and effort residents are willing to devote to composting should be considered before selecting an appropriate unit. How well a composter works is in direct correlation to the conditions of the compost pile. Reaching optimum nutrient, oxygen and moisture levels to reach higher decomposition rates require some level of effort to achieve. Occasional turning, watering and ensuring a balance of green (nitrogen rich material) and brown (carbon rich material) are necessary tasks that can be performed to achieve optimum conditions.

The aesthetic quality of a bin was not a major concern early into the project. However, survey responses, feedback and encounters from customers have demonstrated that the appearance of a bin and individual preferences (e.g. preferring wood bins over plastic or vice versa) cannot be overlooked. The importance of composters that fit the décor of a yard is not surprising as many homeowners, whether it's a form of "artistic expression" or simply "keeping up with the Jones' ", devote countless hours to making their yards beautiful. There was a small fraction of customers from both groups that were not satisfied with the appearance of their bin. To rectify this some customers replied that they had kept the bin out of sight (both groups) or had painted their bin to match other structures in their yards (*Lumberlovers*). In the most extreme case, one customer asked to return her *Lumberlovers* bin because she was not happy with its appearance and later admitting to expecting a black plastic model (Chapter Five). The lesson learned from this incident: a customer that is not satisfied with the appearance of a bin is less likely to start composting. Although there is little organizers can do to satisfy every customer, consideration of aesthetics and providing different composter options for a bin

distribution program would account for variation in customer preferences. The Centre & South Hastings home composting program, for instance, offers six different composter models for citizens ranging in size, features and price.

## **6.8 CUSTOMERS SATISFIED WITH THE COMPOSTING BOOKLETS**

A majority of respondents were shown to have read their booklets and were satisfied with them. The general consensus from customers was that the booklets offered ample information for beginners to start composting and use for reference for future problems and questions. The material from each booklet was comparable but the (*Earthmachine* booklet) had better formatting, clarity and use of illustrations. The RCM booklet did offer two advantages. First, it provided tips for composting during each season in Manitoba's northern climate. This was especially relevant considering the cold winter climate in Winnipeg and the subsequent difficulties experienced by composting households. A smaller percentage of *Lumberlovers* customers experienced severe winter problems. The RCM booklet also included contact information and the web address for local composting support.

Although the booklets provide ample information, there were some interesting comments and recommendations given by customers and employees at the Compost Action Project that garner some discussion. The first was brought up during discussions with RCM's Compost Action Project, who felt that the booklets may be providing too much information that could be overwhelming for beginners. Respondents from both sales reiterated this sentiment, stating that the booklets should be more concise.

The second criticism is in formatting. Although the booklets are easy to store, the compact size means they are easily misplaced. A recommendation given by customers from both survey groups was to create a poster or weather-proof sign containing basic directions on how and what materials to compost. Customers could hang the sign in visible locations where composting activities take place such as in the kitchen or above the composter (hanging sign outside would require weather proofing). Thus the sign would remind homeowners to compost and provide quick “how to” reference material. The sign could be distributed with the information booklet, with the booklet providing customers with supplemental reference material.

The suggestion of this type of visual reminder is supported by the literature and what McKenzie-Mohr & Smith (1999) refer to as a prompt. In their explanation of community based social marketing tools, a prompt is described as:

*A visual or auditory aid, which reminds us to carry out an activity that we might otherwise forget. The purpose of a prompt is not to change attitudes or increase motivation, but simply to remind us to engage in an action that we are already predisposed to do. Prompts should be noticeable, self-explanatory through graphics and/or text explaining what the person should do, should be presented as close in time and space as possible to the targeted behaviour, prompts should be used to encourage people to engage in positive behaviour rather than to avoid environmentally harmful actions.*

McKenzie-Mohr & Smith (1999) also provides specific recommendations for prompts that can help households start and continue to compost:

*Attach a decal to compost units indicating organics that can be composted and the basics of composting. Better yet since neither what can be composted nor the basics of composting changes, require that this information be stamped directly onto the composting unit.*

As well, providing composting information in a prompt-type format that can be posted in an accessible location (near the composter or in the kitchen) reducing the chances of losing the material (or simply forgetting that they have it). An example of an effective prompt is the “Rot Wheeler” quick composting reference guide featured on [www.composters.com](http://www.composters.com) website.



**FIGURE 6.1 ROT WHEELER QUICK REFERENCE GUIDE**

These dual-sided, convenient reference wheels provide quick tips and trouble shooting information for outdoor and worm composting. Another idea would be to create a composting calendar offering tips for composting during the different seasons in Winnipeg. Development of effective prompts should also consider translating information into other languages, as marketing and promotional efforts have been shown

to be more effective if citizens from different cultural receive it in their native tongue (Angus Reid Group 1996).

## **6.9 COMPARING BIN DISTRIBUTION METHODS**

In comparing the truckload bin sale approach and the home composter delivery program, advantages and disadvantages to each program are discussed with elements of successful composting programs in mind. Referred to in Chapter 2, these elements include education, advertising and promotion, customer convenience, and participation rates. Distribution efficiency, which considers the total number of bins distributed over set period of time, is another element that is compared.

### **6.9.1 TRUCKLOAD BIN SALES**

The most evident advantage of the truckload approach is that it draws thousands of customers. It is difficult to argue with a method that distributes thousands of bins in a single day. There is tremendous potential to educate and introduce thousands of residents to the benefits of composting and encourage them to start. Survey analysis also shows that a majority of customers will start using their bins immediately. Clearly the advertising and promotional campaign, which consisted of mailbox flyers, newspaper ads, emails, word-of-mouth, television and radio spots did well to attract customers. By promoting composting as a means to reduce household waste and help the environment helped to raise the profile of composting in the community. Promotional activities leading up to the sale and the event itself also provided civic and provincial leaders (who



supported this initiative) and Resource Conservation Manitoba with good publicity and media coverage.

The park and pick up method also has the potential to become a tremendous community-building event and opportunity for social interaction (although largely untapped during this particular event). For example, the Waterloo Region has been highly successful in incorporating community with its free bin giveaways. “With four lines formed in front of the sign-up table, people had a chance to talk casually about waste reduction and composting” (Gombos 1994). The Waterloo Region also provides free mulch and finished compost for customers that receive a bin. The Region has also included a food drive and encourages customers to provide food donations. With thousands visiting each point of sale, there are charitable organizations in Winnipeg that could certainly benefit by getting involved. For example, something as simple as asking each customer to bring a non-perishable food donation could bring in thousands of items for Winnipeg Harvest and local food banks. The event can also be used to promote volunteerism as each site can use as many helpers as possible to distribute bins, direct traffic, and answer questions about composting.

The downside to having such high attendance numbers is that there simply were not enough knowledgeable staff or volunteers at the event to handle the volume of customers. This format may turn people away who do not want to wait in line or like crowds. Composting education is crucial with a high ratio of residents that have little to no previous experience with composting. Although, composting instructional booklets were

given to customers to take home, educational methods that utilize personal interaction and modeling behaviour have proven more effective in encouraging home composting (McKenzie-Mohr & Smith 2000). With hundreds of customers waiting in line for a bin, however, distributing composters as quickly as possible takes precedence over interacting (i.e. discussing composting, answering questions and connecting) with customers. In the end customers that are new to composting go home with little training or demonstration of how to use their bin. Customers do have the opportunity to attend a free composting seminar facilitated by RCM. However, the ratio of customers that register and actually attend workshops to customers that purchase a bin is very low. Without the diffusion of knowledge from an experienced composter, one can expect the severity and frequency of user problems to increase as well as a lower composter efficiency use rate among new users.

Respondents were generally satisfied with the truckload sale approach but there were changes that could be made to improve customer convenience. Having the bin sale for only one day creates a sense of urgency but may deter customers from purchasing a bin if he or she cannot attend that day. Customers were critical of the long line-ups, lack of parking space, and terrible traffic. The locations of the sales (malls, suburban commercial locations, limited access to buses) and the size of the bins meant residents without a vehicle would have been hard pressed to obtain a bin. These factors may have deterred some customers from purchasing a bin and ultimately from starting to compost. The success of truckload sales is also dependent on weather conditions. One customer asked, “what would we have done if it had rained harder”. If it has not already been

included, a contingency plan for rainy days should be integrated into the planning of the event. Finally, with thousands of people driving a vehicle to each site, unnecessary greenhouse gas emissions are produced.

## **6.9.2 HOME COMPOSTER DELIVERY**

*The home delivery and service offered by this program was one of the reasons we started composting. Had we had to go out and buy a composter and bring it home we would not have started composting. The personal information and setup also aided in our decision to compost. The entire program made it convenient to compost. This point is very important to our composting. I also like the wooden box as opposed to the plastic model (Customer speaking about the delivery program).*

There are a number of important advantages of this approach. This method was certainly more convenient for customers, with a majority of the survey respondents being very satisfied with having the bin delivered. Bins are ready to use immediately, limiting the opportunities to have a composter sitting in the basement or garage not being used. Perhaps the biggest advantage is that it focused on education and personal interaction with owners. A demonstration is provided and customers are given all the necessary information needed to start composting. Customers are also given tips on how to avoid problems such as rodents or smell and how to compost during the winter. Interacting with residents and discussing composting in a positive manner does provide a level of reassurance especially for beginners that are apprehensive about composting. By having the opportunity to talk to someone knowledgeable about composting and knowing that there will be follow-up, there is a level of commitment achieved among users that is expected to increase participation, raise composting efficiency levels, and reduce dropout

rates. As well, only one vehicle is being used to make deliveries in close proximity to each other, thus minimizing greenhouse gas emissions.

The disadvantage to delivering composters is that it is a much less efficient method of distributing bins to a community. It took nearly four months to deliver 160 bins with two people completing an average of seven to ten deliveries per day. As well, long delays between orders and shipping occurred because of manufacturing problems. Depending on the type of bin, deliveries can be fairly labour intensive. The wood bins weighed approximately 50 kilograms and were difficult for a single person to deliver. Two staff may be required for improved safety. Seasonal timing of deliveries should also be considered in this type of endeavour. Deliveries should only occur from late spring to early fall with winter deliveries eliminated completely. Winter deliveries proved very challenging while customers are less likely to start composting if their bin is delivered during sub zero temperatures and there is snow piled up in the backyard. In short, a large-scale delivery program (where thousands of composters are delivered) simply would not be viable considering city the size of Winnipeg and the magnitude of local bin manufacturing operations. Delivery would only be feasible if kept to a moderate scale and if the price of bin reflected the cost of transportation through separate delivery charge to offset fuel and labour costs.

### **6.9.3 DIFFERENT SERVICES FOR DIFFERENT COMPOSTING NEEDS**

By demonstrating respective advantages and disadvantages, the case studies have shown each method of distribution is suited to customers with different composting needs. For

instance, delivery method is the most convenient method for the customer and is best suited for customers that are beginners; require more of a hands-on demonstration of how to use their bin; and may not have the means to pick up a composter. In this case delivery was necessary because of the weight and size of the *Lumberlovers* bin. Providing delivery, demonstration and interacting with customers also encourages higher participation rates by making customers feel more at ease with composting duties. The higher costs of labour, fuel and transportation are significant. In order for this method to be feasible additional funding or revenue would need to be devoted towards it. The high costs of transporting the bins may be offset by charging customers a delivery fee of at least \$7.00-10.00. Grants and funding agencies that support waste minimization initiatives; summer/student employment; and community economic development should be pursued as ways to subsidize the manufacturing costs of the bins and reduce overall costs to customers.

Although the truckload bin sales were found to be less convenient by respondents, this approach is best suited for customers that are more experienced with composting, require less education, ready to start immediately, and have a vehicle to pick up a bin. The line-ups at sales can be improved by providing a pre-distributed order form included in flyers to help shorten administration and processing time needed for each person (RCM 2003) and offering bins for more than one day during the year.

#### **6.9.4 DEVELOPING A COMPREHENSIVE BIN DISTRIBUTION STRATEGY FOR WINNIPEG**

The success of bin sales in other communities suggests that the demand for low cost, quality composters in Winnipeg has yet to be saturated. For example, an evaluation of Portland, Oregon's bin distribution program revealed that even after distributing a total of 60 000 bins between 1994-1999, home composters remained in high demand.

*The findings of the report were surprising. Metro staff had assumed that the demand for compost bins would be saturated after many years of sales. In fact, strong unmet demand still exists in the region and could exceed 100,000 bins. Forty-four percent of all single-family households in the region compost at home using a variety of methods. At current levels, it will take over ten years of annual sales before demand is saturated. The bin distribution program alone has accounted for 47 percent of the growth in the region's home composting participation rate (Foseid 2001)*

Ongoing promotional and educational campaigns and the anticipated implementation of user-pay garbage fees are additional factors that will ensure demand for home composters continues in the coming years.

With this in mind, a more comprehensive supported bin distribution program can be developed that provides residents with multiple options to obtain various composter models that best suit their needs. For instance, truckload bin sales can be held during the spring and fall. Sales can be held during related community events and can look to have greater involvement from local environmental organizations. Meanwhile, bin deliveries can be offered to customers that are willing to pay a fee for delivery and set-up. Communities throughout North America have been successful using a combination of methods to distribute bins. For example, in Massachusetts bins have been distributed through various methods, which include:

*...combination workshop/bin sales; ongoing sales from the community transfer station; recycling drop-off or town hall; one-day bin sales held in spring and fall; sales at related community events such as Earth Day celebration; household hazardous waste collection; health fairs; and recycling events. (McGovern 1997)*

The Centre and South Hastings home composting program were successful using a combination of “park and pick-up” type bin sales and bin deliveries to distribute 18,000 bins to urban and rural areas (RCM 2003). Table 6.2 provides a list of various methods that have been used to distribute bins in communities throughout North America. These include variations of door-to-door delivery programs and large-scale truckload bin sales. As well, partnerships have been established between government and retail stores to sell composters at reduced prices, which utilizes existing infrastructure and encourages businesses to become involved. The drawback to this approach would be less opportunity for education and demonstrating proper composting techniques.

Composting workshops continue to be primary component to composting education programs in Winnipeg. It is very rare for bins to be offered at these workshops. A combination of workshop and bin sale is an option that should be explored, as it would provide participants with another tool to make it easier to start composting immediately after an information session. It may also attract more participants that want to purchase a bin. Advanced customer application for bins is a method that may be used to improve all the different distribution methods.

With regards to the units offered to citizens, other communities have also subsidized more than one type of bin and made them available to the public. For instance, the Massachusetts’ bin distribution program has focused on two bins: the *Earthmachine* and

the “Brave New Composter” (a bin manufactured locally) (McGovern 1997). Centre and South Hastings Ontario also subsidized the cost of two models (Basic Backyard and *Earthmachine*) and helped to distribute three additional models at sales depots (RCM 2003).

There are a handful of organizations and local businesses in Winnipeg that offer composting education and sell bins. The City of Winnipeg, Manitoba Conservation and to a lesser extent Manitoba Product Stewardship Corporation provide a large portion of funding opportunities for composting initiatives. Resource Conservation Manitoba and to a lesser extent Fort Whyte Environmental Centre provide education. Meanwhile bins can be obtained from local distributors such as Fort Whyte, *Lumberlovers*, and retail outlets such as Lee Valley, Canadian Tire, Revy Home Hardware, and Home Depot. There is however, a lack of strong cohesiveness and communication between government, NGO and the business community in regards to promotion and education of home composting in the City. (This may be due to the fact that the few organizations and departments involved with home composting in Winnipeg are stretched to their limits financially and are reluctant to go beyond their organizational scope) A comprehensive compost bin distribution and education program in Winnipeg would benefit if a participatory network/coalition of local organizations, government officials, businesses and community groups involved in composting initiatives were established. This network could be used to discuss ideas; improve lines of communication between groups; establish symbiotic partnerships to assist in each others initiatives; involve partners in the planning process of large scale events and promotions; create a sense of community



ownership among projects; and pool limited resources. At the very least, improving the communication lines may assist the overall composting scene in Winnipeg to move forward. Considering the positive benefits of home composting, greater support (financial and promotional) for local NGOs and businesses promoting composting should be a priority.

**TABLE 6.1 BIN DISTRIBUTION METHODS**

<b>METHOD</b>	<b>DESCRIPTION</b>	<b>ADVANTAGES</b>	<b>DISADVANTAGES</b>
<b>DOOR-TO-DOOR</b>	Trained staff deliver compost units directly to the household Different variations to this method include: Taking orders & delivering them on a later date, selling them on the spot, providing them for free, "survey and sell"	Most convenient method for resident; Can provide education on how to compost on a one-on-one basis;	Approach may be open to criticism from those that are opposed to door-to-door sales; More time consuming; May require two staff at all times for safety reasons; Requires method of transporting compost units; If people are not home have to contact a second time
<b>TRUCKLOAD SALES</b>	Manufacturer organize 1 or 2 day bin sales; Large truck trailers in large parking lot used as point of sale; People purchase bins on a first come first serve basis	Less work on behalf of the municipality as there is no need to process applications; Manufacturers often handle promotion, purchasing; Can makes good use of community groups, volunteers and politicians; Bin-distribution days can be run in conjunction with other community events; Publicity for composting initiatives	Greater risk of running out of bins; No control over how many people will show up on a particular day; Less time for education and training; Customers need to have a vehicle to transport unit and increases traffic, vehicle emissions
<b>RETAIL OUTLETS</b>	Retailers provide bins to municipalities at an affordable price Retailer orders and receives composters directly from manufacturer; Municipality advertises which stores are carrying bins; Can be used in conjunction with a rebate program where municipality	Less work for municipality because it is utilizing existing infrastructure; Convenient for people that shop at particular stores; Allows retailers to become part of program;	Less opportunity for education; Retailers become disenchanted if benefits to them prove insignificant

<b>WORKSHOP &amp; BIN SALE</b>	Distribute composters for a discounted price/free to those that attend the workshop	Bin sale promotion attracts more people to composting workshop; Ensures new customers have appropriate tools and knowledge to start composting and to compost properly; Can gauge number of composters needed	Might discourage people from buying composter; Information may be repetitive for experienced composters that just want to buy a bin; Would require more time and effort to distribute large number of bins; Language barriers may prevent residents with no/limited english skills
<b>ADVANCED APPLICATION</b>	Residents apply to purchase a bin and payment is made in advance; Application can be part of a newspaper ad or brochure; Distribution sites can be: recycling depots, schools, municipal yard, bus terminal, parking lot, park, municipal sites, local environmental organizations or workplaces; Can also be done in conjunction with a workshop	Promotion of the program is in conjunction with the order forms; Can have the correct number of bins on hand; Can organize an efficient system by regulating the number of people who come on a particular day or even in a particular hour; Can send literature in advance	If people do not show up you will have to contact them a second time; Residents may forget distribution days or receipts; Time consuming to process orders;

*Sources: Olds College Composting Technology Centre 1996;  
First Consulting Group And Recycling Council Of Ontario 1994*

## **6.10 BIN SALES IMPROVE WASTE OUTLOOK**

Potential organic waste diverted by bins distributed from the bin sales was estimated and shown to be significant. Based on the participation results of the surveys, estimated composting efficiency of each bin and Winnipeg waste composition statistics, it was determined that the truckload sale had the potential to divert up approximately 243-305 metric tonnes of organic material in a single year. This calculates to an average of 27-34 kilograms/yr diverted from each bin.

In calculating the waste diverted by the composter delivery program, higher participation rates and efficiency rates were accounted for. The 160 distributed bins diverted an estimated fifteen tonnes of organic material and wood waste during the first year of use and has the potential to divert over seven tonnes of household organic material annually. That calculates to approximately 78 tonnes of organics over a ten-year lifespan or approximately 49 kilograms of organics diverted by each bin a year. Thus on per bin basis, the *Lumberlovers* bin offers greater potential to divert waste.

As well actual composting numbers may be greater if complementary composting techniques are included in the overall household waste diversion rates. It is also important to note that home composting can occur outside of a bin. Bins can be used in combination with other forms of composting such as the Leaf it With Us program, mulching, holding units for yard waste, grasscycling. All are effective forms of waste reduction that complement bin composting and help to maximize household waste

diversion. These methods were promoted by the educational components of the bin distribution programs.

#### **6.11 SUPPORTED BIN DISTRIBUTION PROGRAMS: INVESTING IN LONG-TERM COST SAVINGS, HEALTHIER ENVIRONMENT**

The cost savings from waste diverted is another aspect of home composting that should be brought to the forefront. Avoided expenses resulting waste diverted from landfills was calculated for both bin distribution programs. The cost per tonne diverted by bins sold at the truckload bin sale averaged out to \$15.75-19.28/tonne diverted. Based on these figures, it will take only 2.42 years for the City to break even on its initial investment; savings resulting from the avoided landfill expenses will average \$19,800/yr and total cost savings during the 10-year lifespan of an *Earthmachine* is approximately \$150,084. The delivery program, with an operating cost of \$5, 000, averaged a much higher cost per tonne diverted (\$52.03/tonne) due to the fact that the amount of government subsidy per bin was much greater (31.25 per bin versus \$4.80/bin). Nonetheless, the project does result in average annual cost savings of \$264/yr and total savings of \$506 (after breaking even in year eleven) throughout the twelve-year lifespan of a bin. These figures demonstrate that modest expenditures for home composting and bin distribution programs represent a progressive tax savings approach and long-term investment in reducing dependency on landfills and healthier communities.

## **6.12 LINKS TO CLIMATE CHANGE, ORGANIC LAWCARE, AND HUMAN HEALTH**

Successfully encouraging households to compost has positive environmental implications that go beyond waste management. The application of compost, a natural fertilizer, to home gardens and lawns is an important component to organic lawn care and gardening. If composting became common practice in our society, the need and market for commercially available chemical fertilizers and corporate profits would certainly diminish. There is currently a billion dollar market from wide spread domestic chemical fertilizer and pesticide use for home lawn and garden care.

*According to the EPA, in 1996 U.S. citizens used an estimated 70 million tons of fertilizer (lawn and garden use combined) and 70-75 million pounds of pesticide active ingredients (12 million pounds of insecticides, 45 million pounds of herbicides, and 5.4 million pounds of fungicides), valued at a total of \$1.13 billion (Joyce 1998).*

Excessive use of chemical fertilizer and pesticide use for lawn care can result in runoff and leachate that is toxic aquatic ecosystems, can contaminate ground water supplies and can result in severe nutrient overload (Joyce 1998). Meanwhile, children are at serious risk from direct exposure to lawn and garden pesticides. Research from the Ontario College of Family Physicians (OCFP) suggests that exposure to these chemicals during prenatal and early childhood development result in permanent loss of brain function (OCFP 2004). Nitrogen-based fertilizers produce nitrous oxide, which is over three hundred times more effective than carbon dioxide in trapping heat reflected from the Earth. Compost also has long-term benefits to the soil improving the soil's ability to retain and release nutrients and containing beneficial micro-organisms which speed up decomposition of clippings and thatch. Home composting can improve environmental

and human health directly by limiting the use of harmful chemicals. Considering the detrimental health and environmental effects of chemical fertilizer use it is difficult to understand why there is not stronger support for home composting in Winnipeg.

### **6.13 BEYOND WASTE MANAGEMENT: STRENGTHENING COMMUNITIES THROUGH HOME COMPOSTING**

Home composting programs have the potential to do more than minimize waste sent to the landfill. Heightened community awareness of environmental issues; greater community spirit and sense of common purpose; exercise and relaxation; science education; personal pride in taking responsibility for one's own habits and behaviour; job creation and increased volunteerism are all social benefits of home composting (RCM 2003). For instance, the truckload bin sale is an excellent opportunity to promote volunteerism by involving local environmental organizations, youth leadership groups, and community stakeholders to assist in promotion and distributing bins.

Meanwhile, the bin delivery program provided worthwhile opportunities to interact and engage in discussion with community members. A participatory atmosphere was created involving local community groups, businesses, and citizens into the planning and feedback process and utilizing their strengths and resources. This can provide a sense of ownership for a program that greatly increases chances of success and provides a model for future community based composting programs. For the researcher it was an opportunity for personal growth; building confidence, self-esteem, and skills training,

beneficial program outcomes that can be channelled into other areas such as youth development, employment training programs.

Bin distribution programs that consider all the community issues and benefits and seek ways to connect with residents on a personal level can help build healthy communities while achieving waste minimization goals. There is much more work that can and should be done to encourage home composting to become a routine for Winnipeggers. Widespread acceptance of home composting means moving beyond waste management and promoting composting as a tool that can be used to strengthen communities.





**PHOTOGRAPH 6.3 YOUTH HARVESTING LETTUCE FOR DINNER SALAD**



**PHOTOGRAPH 6.4 WEEDING AT EARTHSHARE ORGANIC FARM**



**PHOTOGRAPH 6.5 TURNING COMPOST PILE AT MCGEE COMPOSTING DEMONSTRATION SITE**



**PHOTOGRAPH 6.6 YOUTH SIFTING COMPOST**



**PHOTOGRAPH 6.7 "COMPOSTING & GARDENING IN MY YARD"**

*Composting combined with community or home gardens can improve community health through outdoor recreational activity. Composting and gardening provide people with an opportunity to learn and re-connect with nature.*

*"Composting and Gardening In My Yard" painting by Giselle Villegas 2002*



## **CHAPTER 7 CONCLUSIONS & RECOMMENDATIONS**

### **7.1 INTRODUCTION**

This concluding Chapter returns to the study objectives to present the final conclusions. These objectives include: evaluating supported composter distribution programs including the City of Winnipeg truckload bin sale and a bin sale unique to the City by surveying customers; developing and piloting a bin sale unique to the City; evaluating the effectiveness of the sales; estimating waste diversion potential of the sales and to provide recommendations for current home composting programs and initiatives based on the research. The final section of the Chapter provides an extensive list of recommendations that can be used to improve bin distribution and the overall home composting scene in Winnipeg.

### **7.2 CONCLUSIONS: CITY OF WINNIPEG TRUCKLOAD BIN SALE**

Mail-out surveys were administered to 360 customers who purchased *Earthmachine* composters with 193 surveys returned. Customers were surveyed to see if they had started to use their bins, what materials they were composting, and to obtain feedback regarding various components of the truckload bin sale program. The combination of promotion, advertising, discounted price and convenient access to bins was effective in attracting borderline composters, as 60% of respondents were not composting prior to receiving a bin. Results indicate that 88% of respondents have started to use their *Earthmachine* composter with a majority of these customers composting both kitchen and

yard waste. Problems during initial year of composting were minimal and most respondents expected to continue to use their composter indefinitely. The use of bin subsidies were strongly supported by respondents, whether or not that support corresponds with the overall population remains to be seen. Further analysis revealed the following:

- “Environmental benefits” & “Affordable price” were the most important factors in deciding to purchase a composter;
- At least 86% of the respondents felt “Satisfied-Very satisfied” with the bin, information booklet and the truckload method of distribution;
- Greater than 60% of the respondents experienced slight to severe problems during winter;
- Less than 8% experienced other types of severe problems;
- “Lack of capacity” and “bugs” were “slight problems” with over one-third of respondents; and
- At least 80% would not have purchased the bin at regular price.

Based on the feedback from customers, the *Earthmachine* is best suited for customers lacking ample yard space and producing moderate amounts of organic waste. The truckload bin sale itself was extremely efficient in distributing thousands of bins in a single day and provides a high profile event to promote home composting. The drawbacks include the lack of education and personal interaction for customers seeking composting advice and the overall level of convenience for customers.

### **7.3 CONCLUSIONS: ROT-TO-YOUR-YARD COMPOSTER HOME DELIVERY PROGRAM**

The researcher worked closely with *Lumberlovers* and Resource Conservation Manitoba in developing and piloting a composter home delivery program unique to the truckload bin sale. The sale featured a locally manufactured composter constructed from recycled lumber. As well, a composting information booklet was developed (with handouts from

Resource Conservation Manitoba) and distributed to customers. The program succeeded in distributing 160 composters, providing composting education for these customers through the booklets and composting demonstrations.

Follow-up surveys were conducted to determine if bins were being used, what materials were being composted and problems experienced. Customers were also given an opportunity to provide feedback on the bin, composting booklet, delivery service and use of government subsidies. Surveys were administered to 45 customers, 25 receiving a survey by mail and 20 customers undergoing home visits/interviews. Data analysis revealed high participation rates with 93% of respondents using their bins to compost kitchen and yard waste.

Respondents were pleased with several aspects of the program. The *Lumberlovers* composter scored well among respondents (100% - very satisfied to satisfied) enabling customers to compost greater amounts of kitchen and yard waste. Respondents were also found willing to pay a higher price for a large wooden composter. A \$30.00-40.00 price would be reasonable for customers and likely would not hinder sales. Customers were happy with the information booklet (93% very satisfied to satisfied), feeling that it provided good “how to compost” reference material especially for beginners. The delivery program was certainly favoured by respondents (100% very satisfied to satisfied). Further analysis revealed the following:

- “Environmental benefits” & “affordable price” were the most important factors in purchasing a composter;
- At least 93% “Satisfied” to “Very Satisfied” with the bin, the information booklet and the delivery method of distribution;

- 35% of respondents experienced “slight to severe problems” during winter;
- Less than 2% of respondents experienced other types of severe problems;
- “Appearance”, “Lid Security”, “Lack of capacity” were “slight problems” with at least 16% of respondents;
- At least 68% would not have purchased the bin at regular price.

The delivery program, which included set-up and a quick composting demonstration, and the personal interaction with workers knowledgeable in composting techniques offered high levels of customer service. The overall cost of the program however, limits this approach to small-scale levels. This type of service would not be feasible unless a moderate delivery fee was charged (at least \$7.00-10.00/delivery) or the cost of transportation was reflected in the price of the bin.

#### **7.4 ESTIMATING WASTE DIVERSION POTENTIAL OF SALES**

Potential organic waste diverted by the distributed bins from both sales was estimated based on the participation results of the surveys, estimated composting efficiency of each bin and Winnipeg waste composition statistics. It was determined that the truckload sale had the potential to divert up approximately 243-305 metric tonnes of organic material in a single year. This calculates to an average of 27-34 kilograms/yr diverted from each bin. The 160 bins distributed from the composter home delivery program diverted an estimated fifteen tonnes of organic material and wood waste during the first year of use and have the potential to divert over seven tonnes of household organic material annually. That calculates to approximately 78 tonnes of organics over a ten-year lifespan or approximately 49 kilograms of organics diverted by each bin a year. These significant results may even be understated as additional diversion can be achieved through the Leaf

it With Us program, mulching, and grasscycling, methods promoted by the City of Winnipeg and the bin delivery program.

The potential waste diverted also translates into long-term cost savings. The cost per tonne diverted by bins sold at the truckload bin sale averaged out to \$15.75-19.28/tonne diverted. Based on these figures, it will take only 2.42 years for the City to break even on its initial investment; savings resulting from the avoided landfill expenses will average \$19,800/yr and total cost savings during the ten-year lifespan of an *Earthmachine* are approximately \$150,084. The delivery program, with an operating cost of \$5,000, averaged a much higher cost per tonne diverted (\$52.03/tonne) due to the fact that the amount of government subsidy per bin was much greater (31.25 per bin versus \$4.80/bin for the City). Nonetheless, the project does result in average annual cost savings of \$264/yr and total savings of \$506 (after breaking even in year eleven) throughout the twelve-year lifespan of a bin. These figures demonstrate that modest expenditures for home composting and bin distribution programs represent a progressive tax savings approach and long-term investment in reducing dependency on landfills and healthier communities.

## **7.5 FINAL RECOMMENDATIONS**

The final objective was to make appropriate recommendations to organizations and government departments involved in promoting home composting in Winnipeg based on the findings and experiences gained while conducting this research. These are provided below.

### **7.5.1 CONTINUE TO OFFER SUPPORTED BIN DISTRIBUTION PROGRAMS**

Supported bin distribution programs should continue and be available for all types of bins. Subsidization of home composting activity makes environmental, economic and social sense. Respondents offered strong support for this government initiative. Subsidizing only one or two bins provides an unfair playing field especially for local manufacturers. It also encourages customers to purchase bins that may not be the most appropriate for their household. Customers should be given more than one or two subsidized bin options to choose from.

### **7.5.2 IMPROVE CUSTOMER SERVICE AND ACCESSIBILITY**

Organizations involved in coordinating bin distribution programs should seek ways to improve customer service and accessibility to high quality composters. Combining efforts of local environmental nongovernmental organizations (NGOs) and businesses that produce composters can assist to provide a wider selection of bins to residents. The City of Winnipeg should consider methods to improve truckload bin sale such as offering multiple day sales; distributing order forms for customers to fill out before coming to the sale to help shorten administration and processing time; demonstrating the use of a composter at the bin sale site; offering sales at more locations that are accessible to residents by walking or transit; and inviting volunteers to help distribute bins. Meanwhile, if a delivery program is pursued further, it should be improved by incorporated a delivery, setup and demonstration fee and only delivering during spring, summer and early fall months.



### **7.5.3 DEVELOP COMPREHENSIVE BIN DISTRIBUTION STRATEGY FOR WINNIPEG**

The market for subsidized composters has not been saturated. The onset of user pay garbage fees will also create more demand, as home composting becomes an attractive alternative to paying increased taxes for waste removal. A comprehensive bin distribution strategy would encourage communication and combining the considerable knowledge and expertise government, NGOs and business community regarding home composting and financially supported bin distribution. Subsidized bins should be made available throughout the year (or at least throughout the spring, summer and fall months).

Providing different options for the public to obtain a bin will improve access and encourage a higher rate of participation and home waste reduction. A more comprehensive strategy of distributing composters can include the following:

- Large-scale one to two day truckload bin sales;
- Composter home deliveries for larger models and those who want to pay for delivery;
- Composting workshops with discounted bins available to those in attendance;
- Sales organized by community organizations and educational institutions as fundraisers;
- Work with local bin distributors to offer more products for customers to choose from;
- Subsidized bin sales through retailers and garden centres; and
- Sales run in conjunction with community events such as Earth day, Composting Awareness Week, National Environment Week; Home and Garden Show etc.
- Host a local “Composting Engineering Competition” featuring designs from university and high school students, businesses and independent inventors; and
- Host a “Composting Expo” displaying state of the art composting technology and bin models during Composting Awareness Week.

#### **7.5.4 MAKE EDUCATION AND TRAINING CORE COMPONENTS TO BIN DISTRIBUTION PROGRAMS**

The results show that education and training are necessary to ensure barriers to home composting are alleviated and problems are avoided. These need to be core elements of bin distribution programs included during the planning stages with sufficient funding. With a higher proportion of customers with little composting knowledge and experience, greater efforts need to be directed towards providing these customers with proper composting education, on-going customer support and follow-up to limit future composting problems, customer concerns and maximize bin use. For example, workshops, information sessions, demonstrations can be fashioned for beginners (participants that have just started to compost) to ensure they have proper composting information, feel comfortable to start composting and to avoid potential problems which may cause them to stop.

Education is best served through interactive and demonstrative means. The success of the bin delivery program demonstrates the effectiveness of the “block leader” approach and education through demonstration and personal interaction. In consideration of these educational principles, re-establishing a “Master Composter Training Program” that utilizes community volunteers for a “peer-to-peer” educational model should be pursued.

Providing instructional handouts is also useful for customers as reference material and there is a plethora of information available through local NGOs, the City of Winnipeg and the internet. RCM and the City of Winnipeg should collaborate to develop informational in other formats to enhance learning. For example, a prompt/sign could be

developed containing basic directions on how and what materials to compost. Customers could hang the sign in visible locations where composting activities take place such as in the kitchen or above the composter (hanging sign outside would require weather proofing). The sign would remind homeowners to compost and provide an instructional tool with quick “how to” reference material. The sign could be distributed with the information booklet, with the booklet providing customers with supplement reference material. In terms of content, there should be greater emphasis, promotion and education of complementary such as grasscycling, Leaf it with us, mulching, rototilling, and vermin-composting to complement composting in bins. Based on the results of the surveys, customers would benefit greatly if tips on composting in northern climates were provided with bins. In addition to handouts, a composting themed calendar, offering attractive photographs and composting tips, could provide an appropriate medium for citizens to learn how to compost during Winnipeg’s seasonal variations. These could be distributed as a hardcopy or made free to download from the City’s or RCM’s website. Finally, the translation of composting information for non-English speaking residents would be beneficial in encouraging residents from various ethnic backgrounds.

#### **7.5.5 INTEGRATE FOLLOW-UP STUDIES AND SUPPORT METHODS FOR CUSTOMERS**

Follow-up and providing customer support should be integrated into any bin distribution program. Follow-up surveys and the compost help line are worthwhile initiatives that help to maintain high participation rates. Responses from the surveys indicate customers were strongly in favour of follow-up action that encourages and assists home composters. Follow-up courtesy calls or visits can also be made to determine if customers have started

to use their bin, answer questions, alleviate concerns, and provide positive reinforcement for those that have started to use their bins. Customers contacted can be prioritized based on composting experience with beginners, who are more likely to experience problems and a reluctance to start using their bin, being the initial focus. Data from follow-up is also useful for estimating composting efficiency and waste diversion rates. On-line surveys may be an effective option for residents with internet access to provide feedback.

#### **7.5.6 ADDRESS STUDY LIMITATIONS AND PURSUE OPPORTUNITIES FOR FUTURE RESEARCH**

The experience of developing, conducting and analyzing the results of the mail-out surveys and customer visits survey has revealed a number of study limitations and areas for future research. One of the more important drawbacks to make note of is that results are not representative of all Winnipeg residents. There is certainly an inherent bias for both cases because only customers that purchased a bin were sampled. By purchasing composter, these residents have already demonstrated their motivation and positive attitude towards composting. With respect to the truckload bin sale, sampling methods did not capture those residents that may have been reluctant to purchase a composter because they could not attend the sale on that day or because of the long line-ups at the sale venues. To alleviate these information gaps, a study should be conducted with randomly selected households in Winnipeg to gain further insight into baseline home composting rates, changes in participation rates due to bin distribution programs, motivating factors and willingness to participate in future composting initiatives.

Although the findings that a majority of customers are using their composters, it is too early to tell whether these rates will continue. Authors including RCM (2003) and Bagby (2000) indicate that participation rates are likely to level out, as bin distribution programs generally have a drop out rate (where a percentage of customers stop using their composter) of 10-15% (RCM 2003). Bin sales in Seattle, for instance, resulted in average long-term usage rate of approximately 70% (Bagby 2000). It is assumed that similar drop out rates will occur over time among participants. According to RCM (2003), providing support and services including door to door delivery, offering a question & answer session, installation, follow-up calls and post-installation visits will likely result in higher usage rates among participants. Feedback from *Lumberlovers* customers reflects this sentiment for long-term composting commitment. Therefore, higher long-term usage rates are expected for the wood bin sale customers. However, further studies would be required to confirm this assumption. Thus, follow-up surveys conducted in multi-year intervals (for example: five and ten years from the date of purchase) should be conducted to provide further insight into the effectiveness of the sales and their impact on long-term UR for participants. Studies conducted during these time frames can also be used to assess the durability of the bins as they undergo the weathering and stress of northern climatic conditions.

Research should also include more accurate analysis of participants composting efficiency. This could potentially include home visits to obtain visual confirmation that the customer is actually using the bin; analysis of types of materials composted; amount of material composted; problems experienced; harvesting and use of finished compost;

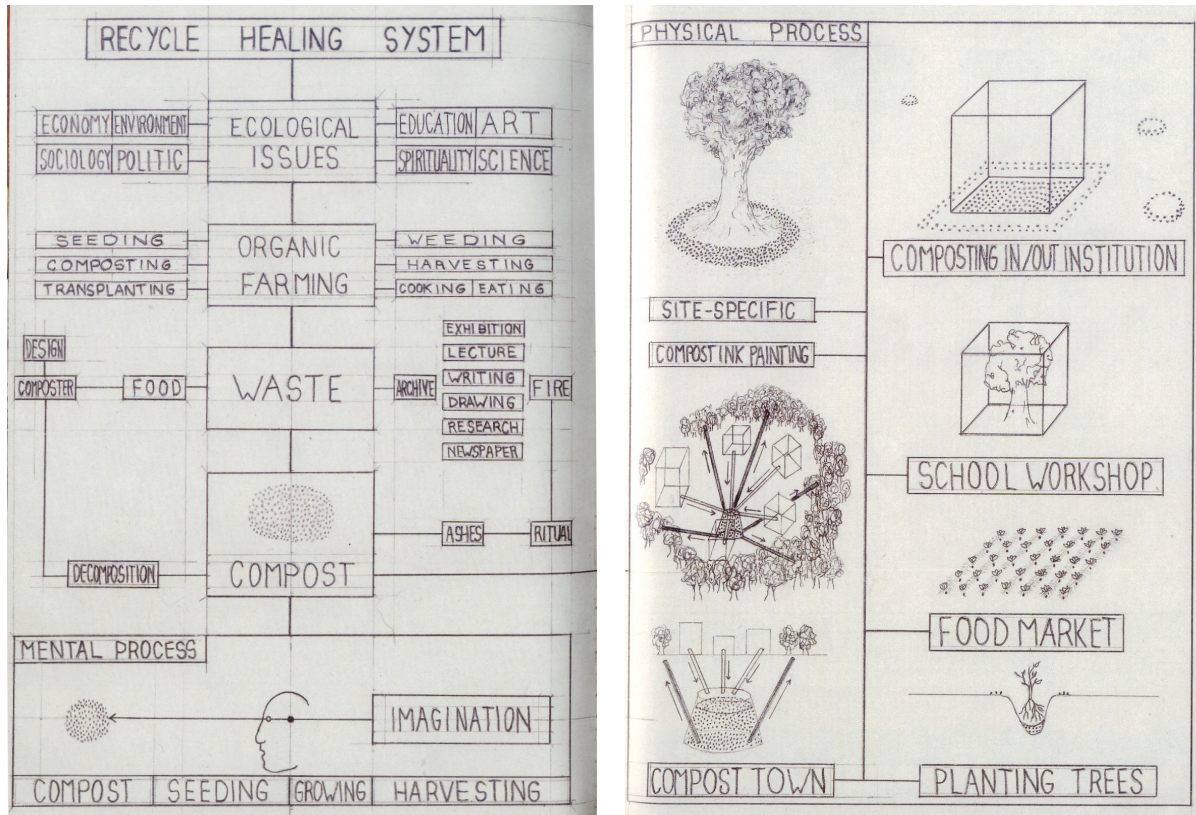
willingness to speak to peers about composting; and development of a “effective use rating/scoring system”. This proposed system would involve participants being assessed based on survey responses and points given for “effective use” of their composters using the above data.

#### **7.5.7 LOOK AT THE BIGGER PICTURE**

Measuring the true value of the bin distribution programs and the increase in home composting activity goes beyond waste reduction and cost savings. Heightened community awareness of environmental issues; greater community spirit and sense of common purpose; exercise and relaxation; science education; personal pride in taking responsibility for one’s own habits and behaviour; job creation and increased volunteerism are all social benefits of home composting (RCM 2003).

Meanwhile, the bin delivery program provided worthwhile opportunities to interact and engage in discussion with community members. A participatory atmosphere was created involving local community groups, businesses, and citizens into the planning and feedback process and utilizing their strengths and resources. This can provide a sense of ownership for a program, which can greatly increase chances of success and provides a model for future community-based composting programs. In order to foster true change, all aspects of composting and the positive impacts it can have on a community should be respected and considered. Ecology, community health, culture, politics, economics and spirituality, composting connects to a broader range of issues than what is generally first thought of. Consideration of these wide-ranging aspects can help in developing creative

“out-of-the-box” solutions for waste management while also addressing broader environmental and societal issues.



**FIGURE 7.1 ARTIST’S INTERPRETATION OF COMPOSTING & INTERCONNECTED ISSUES**

*Source: Grassioulet 2004*





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## APPENDIX A: TRUCKLOAD BIN SALE FLYERS

# ONE DAY ONLY COMPOST BIN SALE

**Sponsored by**  
City of Winnipeg and Province of Manitoba




**SATURDAY, MAY 8, 2004 ~ 8 A.M - 4 P.M.**

---

An \$80.00 Value **\$25.00** TAX INCL.  
**FOR ONLY**

*First Come, First Served  
Rain or Shine*

*While Quantities Last*

*Cash and Cheques Only*

*No Limit on  
Purchase of Bins*



**FREE  
HOME COMPOSTING  
HANDBOOK WITH  
PURCHASE.**

*Compost Turners and  
Kitchen Scrap Pails  
also available!*

*Composting experts will be  
available at each site to  
answer questions.*

**1,250 COMPOST BINS AVAILABLE AT EACH  
OF THE FOLLOWING FOUR LOCATIONS**

<p><b>ST. JAMES CIVIC CENTRE</b> 2055 Ness Ave. at Woodlawn St.</p>	<p><b>KILDONAN PLACE SHOPPING CENTRE</b> 1555 Regent Ave. W. South Parking Lot</p>
<p><b>GARDEN CITY SHOPPING CENTRE</b> 2305 McPhillips St. South East Corner Parking Lot</p>	<p><b>ST. VITAL CENTENNIAL ARENA</b> 580 St. Anne's Rd.</p>

FOR MORE INFORMATION ON THE SALE, PLEASE CALL THE CITY'S WATER AND WASTE DEPARTMENT CUSTOMER SERVICE CENTRE AT 986-5858  
FOR INFORMATION ON COMPOSTING, CALL RESOURCE CONSERVATION MANITOBA COMPOST INFOLINE AT 925-3777



# The Real Dirt on Composting!

---

**What is composting?**  
Composting is the natural process of breaking down organic material, such as kitchen and yard waste, to produce a nutrient-rich, soil-like material. The process works with the help of micro-organisms such as bacteria and fungi combined with air and moisture.

---

**Why should I compost?**  
Composting:

- Turns kitchen and yard wastes into usable resources - FOR FREE!
- Benefits plants, trees and shrubs by returning valuable nutrients to the earth and increasing water retention of soil.
- Reduces the amount of garbage sent to the landfill.

---

**What materials can I compost?**  
Organic materials can be composted, such as:

- grass clippings
- garden waste, flower clippings, leaves, and weeds (before they flower)
- fruit and vegetable scraps, tea bags, coffee grounds and filters
- tea leaves and bags
- nutshells, eggshells

**Composting can reduce  
your household garbage by  
approximately one-third!**

## THE EARTH MACHINE BACKYARD COMPOST BIN



- Large 360 litre capacity.
- Easy snap together assembly.
- Rodent resistant.
- 10 year warranty.
- Made of recycled materials
- Fits in any vehicle.
- Over 2,500,000 in use

COMPOST = HEALTHY SOILS = HEALTHY PLANTS = HEALTHY PEOPLE = HEALTHY PLANET

PRINTED IN CANADA - RECYCLED PAPER

APPENDIX B. BIN SALE ADVERTISEMENT IN  
TRANSCONTINENTAL WEEKLIES

**DISCOUNT WOODEN  
BACKYARD  
COMPOSTERS  
FOR SALE!**

**\$25**  
Retail Value \$75



- ◆ 100% Recycled wood!
- ◆ 900 Litre capacity!
- ◆ Includes composting instructional booklet
- ◆ Removable lid & front panel
- ◆ Easy to assemble

*As part of a composting study conducted by the Natural Resources Institute of the University of Manitoba (U of M), a limited number of lumber lovers' backyard composters will be available at the discount price of \$25 (including delivery set-up, composting instructions).*

To be eligible for the discount individuals must:

- + Be at least 18 years of age
- + Not be currently composting
- + Live in Winnipeg
- + Not living in an apartment or condominium; and
- + Agree to participate in the U of M composting study. (Participants will be required to complete a brief survey at the end of the study.)

**LIMIT 1 COMPOSTER PER HOUSEHOLD**

**PLEASE CONTACT GERALD AT 955-2964  
OR EMAIL: COMPOST@EL@S.HO.CA  
TO PLACE AN ORDER**

 university of manitoba  
Manitoba  
Conservation 

**Lumber Lovers**

Resource Conservation  
Manitoba

2008/01/0001



## APPENDIX C PRESS RELEASE

Press Release October 11, 2002:  
Discount Backyard Compost Bin Sale Encourages  
Winnipeggers to Reduce Waste Sent to Landfills

### Local Composting Study Begins with Compost Bin Sale

Interested in backyard composting? This fall, thanks to a grant provided by the Province of Manitoba's Waste Reduction and Pollution Prevention Fund, Winnipeg residents can buy compost bins for the discounted price of \$25. These particular bins are constructed locally out of recycled lumber and are normally sold for \$75. The bin sale is one component of a composting study being conducted by Gerald Villegas, a Masters student from the University of Manitoba's Natural Resources Institute.

"The purpose of the study is to examine different approaches to encouraging people to compost at home," says Villegas. "We are hoping to attract people that are new to composting and give them an incentive to start composting at home. Once we have finished selling our composters, I will be conducting surveys with our customers to determine if they have started to compost and how they feel about the composting experience."

Other aspects of the study include door-to-door distribution of composting information in selected neighborhoods (which will get underway during the spring of 2003), as well as follow-up surveys with people that purchased a compost bin from the City of Winnipeg last June (2002).

Villegas says that his bin sale is in no way trying to compete with the City of Winnipeg and its truckload sale approach. "We just don't have the resources to duplicate the what the City did last summer. The City's composter sale sold over 8000 composters and did a tremendous job in distributing them out to the public. I can safely say, though, that our approach is offering some interesting features that the City's program didn't have." Convenience and education appear to be two strong selling points for this program. For \$25, customers receive a composter delivered and set up right in their backyard. Customers are also provided with composting educational material (produced by local composting experts Resource Conservation Manitoba (RCM)) that provides information on how to start and maintain an effective compost pile even in spite of our frigid winters. The program also features two delivery people that are knowledgeable about composting and always willing to offer tips on how to get started.

"I'm having a blast meeting and talking to people about composting! It's also been great experience collaborating with Sean on this project," says Villegas.

Villegas is working closely with Sean Murphy, a local entrepreneur that was selected to manufacture the composters for the project. *Lumberlovers* is the apt title of Murphy's used lumber recovery and recycling business. Starting with just a couple of hammers and a pickup truck, *Lumberlovers* has gone through many changes over the years and has

emerged as a strong factor in Winnipeg's waste diversion efforts. Murphy has completed a variety of different projects over the years from building fences and coffee tables to recycling used shipping pallets. Right now, Murphy's bread and butter is composters. "Lumberlovers has sold nearly 200 composters this year to Winnipeg residents and non-profit groups such as the West Broadway Community Centre, Spence Neighborhood Association, and the Winnipeg Folk Festival," states Murphy. And just as *Lumberlovers* has evolved over the years so has the design of its composters. "The current model is designed according to several recommendations from RCM."

Some special features include a removable lid and front panel for improved accessibility to the compost pile, a 900-litre capacity (nearly three times the size of most composters on the market), and perhaps the most important feature from a waste diversion standpoint – they are made from 100% recycled lumber.

"Each composter contains nearly 100 pounds of used lumber that most likely would have ended up rotting in a landfill, says Murphy. If we reach our goal of selling 160 composters, we have the potential of diverting nearly 8 tons of wood waste with our "little" project, and that's not even including the amount organic waste that can be diverted if each household actually uses the composter."

The two are well on their way to achieving that goal and are hoping that the upcoming Waste Reduction Week (October 21-27 2002) will provide a boost in composter sales. National Waste Reduction Week is a yearly event during which schools and municipalities are encouraged to promote reducing, reusing, recycling and composting, as well as energy and water conservation.

In the end, both Villegas and Murphy hope that the results of the study will encourage greater government support for bin subsidy programs that incorporate innovative methods to educate the public about composting. If you are interested in purchasing a composter or want more information about the study contact Gerald at 955-2964, or email him at [composterdeal@yahoo.ca](mailto:composterdeal@yahoo.ca).



## APPENDIX D: ARTICLES FROM TRANSCONTINENTAL WEEKLIES & MANITOBAN

# Compost bin sale gets some amazing results

Interested in backyard composting? This fall, thanks to a grant provided by Manitoba's Waste Reduction and Pollution Prevention Fund, Winnipeg residents can buy compost bins for \$25.

These particular bins are constructed locally out of recycled lumber and are normally sold for \$75.

The bin sale is one component of a composting study being conducted by Gerald Villegas, a Masters student from the University of Manitoba's Natural Resources Institute.

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"Once we have finished selling our composters, I will be conducting surveys with our customers to determine if they have started to compost and how they feel about the composting experience."

Other aspects of the study include door-to-door distribution of composting information in selected neighborhoods (which will get under way during the

spring of 2003), as well as follow-up surveys with people that purchased a compost bin from the city last June.

Villegas says his bin sale is in no way trying to compete with the City of Winnipeg and its truckload sale approach.

"We just don't have the resources to duplicate what the city did last summer. The city's composter sale sold over 8,000 composters and did a tremendous job in distributing them out to the public."

"I can safely say, though, that our approach is offering some interesting features that the city's program didn't have."

Convenience and education appear to be two strong selling points for this program. For \$25, customers receive a composter delivered and set up right in their backyard.

They are also provided with composting educational material, produced by Resource Conservation Manitoba, which provides information on how to start and maintain an effective compost pile, in spite of frigid winters.

The program also features two delivery people, who are knowledgeable about composting and always willing to offer tips on how to get started.

"I'm having a blast meeting and talk-

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Villegas is working closely with Sean Murphy, a local entrepreneur who was selected to manufacture the composters for the project.

Lumberlovers is the apt title of Murphy's used lumber recovery and recycling business. Starting with just a couple of hammers and a pickup truck, Lumberlovers has gone through many changes over the years and has emerged as a strong factor in Winnipeg's waste diversion efforts.

Murphy has completed a variety of different projects over the years, from building fences and coffee tables to recycling used shipping pallets. Right now his bread and butter is composters.

"Lumberlovers has sold nearly 200 composters this year to Winnipeg residents and non-profit groups, such as the West Broadway Community Centre, Spence Neighbourhood Association, and the Winnipeg Folk Festival," states Murphy.

And just as Lumberlovers has evolved over the years, so has the design of its composters.

"The current model is designed according to several recommendations

from RCM."

Some special features include a removable lid and front panel for improved accessibility to the compost pile; a 900-litre capacity (nearly three times the size of most composters on the market); and perhaps the most important feature from a waste diversion standpoint – they are made from 100 per cent recycled lumber.

"Each composter contains nearly 100 pounds of used lumber that most likely would have ended up rotting in a landfill," says Murphy.

The goal of selling 160 composters, if reached, will have the potential of diverting nearly eight tons of wood waste, not including the amount of organic waste that can be diverted if each household actually uses the composter.

In the end, both Villegas and Murphy hope that the results of the study will encourage greater government support for bin subsidy programs that incorporate innovative methods to educate the public about composting.

If you are interested in purchasing a composter or want more information about the study, contact Gerald at 955-2964, or e-mail him at composterdeal@yahoo.ca.

Erin Bockstael - News Features Editor 474-8293 tobanfeatures@umanitoba.ca

### NEWS FEATURES

15

## Reducing your waste for Waste Reduction Week

Erin Bockstael

Oct. 21 to 27 is National Waste Reduction Week. It is estimated that roughly one third of household waste can be composted, making composting an effective way for an individual to cut down on the amount sent to the landfill. It's also a source of no-cost organic fertilizer as an end product.

Gerald Villegas, a master's student at the U of M's Natural Resources Institute, is enthusiastic about backyard composting. He aims to encourage people to compost with

his three-part composting project.

Villegas has received a grant of \$14,000 from the Province of Manitoba's Waste Reduction and Pollution Prevention Fund to subsidize the cost of the composting units. This enables him to sell composters at \$25, far below the retail price of \$75 for the units.

The composters are delivered and set up for the customers, and included in the cost is an information package produced by Resource Conservation Manitoba (RCM) detailing how to



Villegas (right) setting up a new backyard composter

Finished recycled-wood composters waiting to be delivered



photo courtesy of Gerald Villegas

start and maintain a compost pile. Villegas's study will also be distributing composting information packages door-to-door in selected neighborhoods. "We're hoping to attract people that are new to composting and give them an incentive to start composting at home," remarked Villegas. The information is tailored to the unique challenges of composting year-round in Winnipeg.

The composters are made locally from recycled lumber, that is, lumber that's been previously used for another purpose. Villegas aims to sell 160 composters. Meeting that goal will divert nearly eight tons of wood waste from the landfill before cus-

tomers even use the composters.

Sean Murphy of Lumberlovers, a company that works exclusively with recycled lumber, manufactures the composters. "The current model is designed according to several recom-

mendations from RCM," he states. The composters have a 900-litre capacity and a removable lid and front panel for ease of turning and monitoring the compost heap, as well as easy removal of the finished compost.

The City of Winnipeg subsidized the cost of backyard composting

units in June 2002. Nine thousand composters were sold at a cost of \$25 apiece. In the spring of 2003, Villegas will be surveying the Winnipeggers who decided to give composting a try through both his program and the

City's program. "I will be conducting surveys with our customers to determine if they have started to compost and how they feel about the composting experience."

Meeting that goal will divert nearly eight tons of wood waste from the landfill before customers even use the composters.

## APPENDIX E: COMPOSTING INFORMATION BOOKLET



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## APPENDIX F CITY OF WINNIPEG COMPOSTER SALE QUESTIONNAIRE AND INTRODUCTORY LETTER

Dear Sir or Madam:

My name is Gerald Villegas and I am a Masters student from the University of Manitoba. You have received this package because a member of your household purchased a compost bin from the City of Winnipeg in June of 2002. First off, I just wanted to congratulate you for exhibiting the initiative in buying a composter, and taking a big step in reducing the amount of waste your household produces.

I am currently researching methods that encourage people to start composting at home. As part of this research I am conducting a follow-up surveys with households that purchased a compost bin from the City of Winnipeg. The purpose of the survey is to assess the effectiveness of the City's compost bin sale in motivating people to compost and to see where improvements can be made for the program. This is where you can be a huge help to me by taking a few minutes to fill out the following composting questionnaire. This package includes this **introductory letter**, a **short questionnaire**, and an **addressed, stamped envelope**, which you can use to return the completed questionnaire at no cost.

This research has been funded by *Manitoba Conservation* and has been approved by *University of Manitoba Joint-Faculty Research Ethics Board*. The names of all respondents to the questionnaire will be kept confidential. Any final reports prepared by the researcher will be written without names from individual households. We will not be attributing specific comments to you or anyone else who agrees to participate. Results of the questionnaire will be used in an aggregate fashion only. Any reports produced will be made available to participants who request a copy. If you have any concerns or complaints about this project you may contact the Human Ethics Secretariat at 474-7122.

Please note by agreeing to fill out this survey, you are free to refrain from answering any questions you prefer to omit without prejudice or consequence. Your continued participation should be as informed as your initial consent, please feel free to contact me at **955-2964** or via email at [composterdeal@yahoo.ca](mailto:composterdeal@yahoo.ca) to ask for clarification or new information while filling out the survey. I also want to make it clear that your input is just as important if you do not compost, as it is if you are currently composting. There will be no negative impact from this survey for anyone that is not composting.

Please try to return the completed survey to me by **Tuesday March 25, 2003**. The survey takes only about 5-10 minutes to fill out and as an added bonus, all respondents will be entered into a draw for composting related prizes such as a recycled wood composter, a vermicomposting video kit and composting resource books. Thank-you so much for participating in this survey and helping me complete this project! Your participation will play a vital role in developing effective home composting programs and providing citizens with the best service possible.

Sincerely,

Gerald Villegas  
Primary Researcher

**APPENDIX G CITY OF WINNIPEG  
COMPOSTER SALE EVALUATION SURVEY**

1. How did you hear about the City of Winnipeg’s truckload bin sale? (check all that apply)

- Mailbox Flyer                       Radio                       Email/Internet  
 Newspaper advertisement    Friend    Other (please specify \_\_\_\_\_)

2. Which member of the household suggested purchasing a composter? (check all that apply)

- Adult male(s)    Adult female(s)    Teenager(s)    Child (under 13 years old)

3. What is the highest level of education attained by the person(s) identified in question 2?

- Elementary/ high school    University    Community college    Other \_\_\_\_\_

**4. (a.) Thinking of why your household purchased a compost unit, rate the importance of the following reasons on a six-point scale where “1” is “not at all important”; “5” is “very important”.**

	Not at all important	Somewhat Important	Neutral	Important	Very Important	Don’t know (√)
a.) Reducing the amount of waste generated by your household	1	2	3	4	5	
b.) Feelings of satisfaction from helping the environment	1	2	3	4	5	
c.) Producing compost for home garden, lawn and/or houseplants	1	2	3	4	5	
d.) Saving money by decreasing the need for store bought fertilizers	1	2	3	4	5	

Thank-you for Participating in this Study!

	Not at all important	Somewhat Important	Neutral	Important	Very Important	Don't know (√)
e.) Being encouraged by someone I know (friend/family/neighbors) to start composting	1	2	3	4	5	
f.) Access to composting information from books, brochures, newsletters, internet, displays, or workshops	1	2	3	4	5	
g.) The compost bin sale promotion made it affordable to purchase a composter	1	2	3	4	5	
h.) We have wanted to compost for a while and the bin sale provided a meaningful incentive to start	1	2	3	4	5	

**4. (b.) Can you think of any other reasons why you purchased your compost bin?**

**Please fill in and rate below:**

	Not at all important	Somewhat Important	Neutral	Important	Very Important	Don't know (√)
i.) Other:	1	2	3	4	5	
j.) Other	1	2	3	4	5	

5. Did you compost at your current place of residence before purchasing a composter from the City of Winnipeg?

Thank-you for Participating in this Study!



Yes

No

6. (a.) Have you started to use your City of Winnipeg composter yet (Earth Machine Model)?

Yes

No

b.) If you answered “ yes” skip to #7.

c.) If you answered “no” please provide some of the reasons that have prevented you from starting to use the composter.

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d.) Do you plan on starting to use the composter in the near future?

Yes

No

If “yes” when? \_\_\_\_\_

**FOR RESPONDENTS THAT HAVE NOT STARTED TO USE THEIR CITY OF WINNIPEG COMPOSTER PLEASE PROCEED TO # 13.**

7. Which of the following do you compost? (Circle Yes/No/Not yet)

Kitchen Scraps				Yard Trimmings			
<b>Fruits &amp; Vegetables</b>	Yes	No	Not yet	<b>Grass Clippings</b>	Yes	No	Not yet
<b>Coffee grounds</b>	Yes	No	Not yet	<b>Garden Trimmings</b>	Yes	No	Not yet
<b>Egg Shells</b>	Yes	No	Not yet	<b>Leaves</b>	Yes	No	Not yet
<b>Plate Scraps</b>	Yes	No	Not yet				
<b>Bread</b>	Yes	No	Not yet				

Thank-you for Participating in this Study!

<b>Meats</b>	Yes	No	Not yet
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8. Who in your household does the following compost tasks most of the time? (Please check all that apply)

	Adult Male(s)	Adult Female(s)	Teenager (s)	Child (under 13)
Separating and storing food wastes in the kitchen	•	•	•	•
Taking the kitchen waste to the compost unit	•	•	•	•
Putting yard waste in the composting unit	•	•	•	•
Tending the compost pile (i.e. turning, watering and removing the compost)	•	•	•	•

9. Considering your household's experience with composting, please tell me how easy or difficult it was for you and members of your household to incorporate the following composting tasks into your daily routine.

	Easy	Somewhat Difficult	Very Difficult	Any comments?
Separating and storing food wastes in the kitchen.	•	•	•	_____
Taking kitchen waste to compost unit	•	•	•	_____
Putting yard waste in the composting unit	•	•	•	
Tending the compost pile (i.e. turning, watering and removing the compost?)	•	•	•	_____

Thank-you for Participating in this Study!

10. Please indicate if you have had any of the following problems while composting, the severity of each and whether you were able to resolve them.

	No Problem	Slight Problem	Severe Problem	How resolved, if at all
Assembly of unit (if applicable)	•	•	•	
Odors	•	•	•	
Rodents	•	•	•	
Flies & bugs	•	•	•	
Lack of capacity	•	•	•	
Lid of the unit not secure	•	•	•	
Too cold to compost during the winter	•	•	•	
Appearance of your compost unit	•	•	•	
Lack of relevant/accessible composting information	•	•	•	
Complaints from neighbors	•	•	•	
Other:	•	•	•	
Other:	•	•	•	

11. Have any of these problems been severe enough to make you stop composting?

Thank-you for Participating in this Study!

Yes

No

12. If yes, please list the problem(s) that made you stop composting.

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13. a.) How satisfied are you with your City of Winnipeg (Earth Machine) composting unit?

Very  
satisfied

Satisfied

Not satisfied

13. b.) Do you have any suggestions for improving the unit?

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14. a.) Have you reviewed the composting informational material provided with the unit?

Yes

No

14. b.) If yes, how satisfied are you with the composting informational material provided with your unit?

Very  
satisfied

Satisfied

Not satisfied

14. c.) Do you have any suggestions for improving the material?

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Thank-you for Participating in this Study!



	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know (√)
c.) It is inconvenient to put yard waste in the composting unit	1	2	3	4	5	
d.) It is inconvenient to tend the compost pile (turning, watering and removing the compost)	1	2	3	4	5	
e.) Composting will attract rodents	1	2	3	4	5	
f.) Composting will attract flies	1	2	3	4	5	
g.) Compost takes too long to break down	1	2	3	4	5	
h.) The cost of a compost unit prevents me from composting	1	2	3	4	5	
i.) Its too cold to compost during the winter	1	2	3	4	5	

18. a.) As you may know the cost of your composting unit was subsidized by the Province of Manitoba and the City of Winnipeg. The current retail price for this particular composting unit is 80\$. If no subsidy had been available and the composting units were sold to homeowners at the retail price, would you still have decided to purchase your composting unit?

Yes (skip to question 21)       No

18. b.) If no, please tell us what retail price you would have been willing to pay for this unit:

\$ \_\_\_\_\_

18. c.) Please provide any comments or opinions you may have regarding the composter subsidy?

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Thank-you for Participating in this Study!

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We would now like to ask some personal information that will be helpful to us in comparing your answers to those of other respondents in the survey.

19. Please indicate whether you own or rent your present dwelling.

Own  Rent

20. Into which of the following categories does your dwelling fall?

Single detached

Semi-detached

Duplex

Triplex

Row House

Other – please specify \_\_\_\_\_

21. Which of the following is the language most often spoken in your household? (check all that apply)

English  Portuguese

French  German

Italian  Greek

Chinese  Spanish

Filipino  Japanese

Other – please specify \_\_\_\_\_

22. Please indicate the number of people in your household who fall into each of the following age and sex categories

**Males**  
 Under 20  35-44 years  55-64 years

Thank-you for Participating in this Study!





**APPENDIX G**  
**COMPOSTER DELIVERY PROGRAM EVALUATION SURVEY**

**NAME:** \_\_\_\_\_

1. How did you hear about the University of Manitoba’s compost bin sale?

- Newspaper advertisement     Friend     Email
- Other (please specify) \_\_\_\_\_

2. Which member of the household suggested purchasing a composter? (If more than one, please check all that apply)

- Adult male(s)     Adult female(s)     Teenager(s)     Child (under 13 years old) |

3. What is the highest level of education attained by the person(s) identified in question 2?

- Elementary/ high school     University     Community College     **OT** \_\_\_\_\_  
**ER**

**4. (a.) Thinking of why your household purchased a compost unit, rate the importance of the following reasons on a six-point scale where “1” is “not at all important”; “5” is “very important”;**

	Not at all important	Somewhat Important	Neutral	Important	Very Important	<b>DON'T KNOW (✓)</b>
a.) Reducing the amount of waste generated by your household	1	2	3	4	5	
b.) Feelings of satisfaction from helping the environment	1	2	3	4	5	
c.) Producing compost for home garden, lawn and/or houseplants	1	2	3	4	5	

Thank-you for Participating in this Study!

	Not at all important	Somewhat Important	Neutral	Important	Very Important	DON'T KNOW (√)
d.) Saving money by decreasing the need for store bought fertilizers	1	2	3	4	5	
e.) Being encouraged by someone I know (friend/family/neighbors) to start composting	1	2	3	4	5	
f.) Access to composting information through various mediums (e.g. Books, brochures, newsletters, internet, displays, workshops, telephone hotline)	1	2	3	4	5	
g.) The compost bin sale promotion made it affordable to purchase a composter	1	2	3	4	5	
h.) We have wanted to compost for a while and the bin sale provided a meaningful incentive to start	1	2	3	4	5	

**4. (b.) If you have any other reasons for purchasing a compost bin please fill in and rate below:**

	Not at all important	Somewhat Important	Neutral	Important	Very Important	Don't know (√)
i.) Other:	1	2	3	4	5	
j.) Other	1	2	3	4	5	

Thank-you for Participating in this Study!

	Not at all important	Somewhat Important	Neutral	Important	Very Important	Don't know (√)
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**5. a.) Did you compost at your current place of residence before purchasing a composter?**

Yes                       No

b.) What previous experience do you have with composting? Please explain below.

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6. (a.) Have you started to use the composter purchased from the University of Manitoba (*Lumberlovers* Recycled Wood Composter) yet?

Yes                       No

**b.) If you answered “yes” Proceed to #7.**

**c.) If you answered “no” please provide some of the reasons that have prevented you from starting to use the composter.**

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d.) Do you plan on starting to use the compost unit in the near future?

Yes                       No

Thank-you for Participating in this Study!

If “yes” when? \_\_\_\_\_

**(FOR RESPONDENTS THAT ARE NOT COMPOSTING AT ALL PLEASE PROCEED TO #13)**

7. Which of the following do you compost? (Circle 1 of Yes/No/Not Yet)

<b>Kitchen Scraps</b>				<b>Yard Trimmings</b>			
<b>Fruits &amp; Vegetables</b>	Yes	No	Not Yet	<b>Grass Clippings</b>	Yes	No	Not yet
<b>Coffee grounds</b>	Yes	No	Not Yet	<b>Garden Trimmings</b>	Yes	No	Not Yet
<b>Tea Bags</b>	Yes	No	Not Yet	<b>Leaves</b>	Yes	No	Not Yet
<b>Egg Shells</b>	Yes	No	Not Yet				
<b>Plate Scraps</b>	Yes	No	Not Yet				
<b>Bread</b>	Yes	No	Not Yet				
<b>Meats</b>	Yes	No	Not Yet				

8. Who in your household, does the following compost tasks most of the time? (please check all that apply)

	Adult Male(s)	Adult Female(s)	Teenager (s)	Child (under 13)
Separating and storing food wastes in the kitchen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Taking the kitchen waste to the compost unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Putting yard waste in the composting unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tending the compost pile (i.e. turning, watering and removing the compost)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Thank-you for Participating in this Study!

9. Considering your household's experience with composting, please tell me how easy or difficult it was for you and members of your household to incorporate the following composting tasks into your daily routine.

	Easy	Somewhat Difficult	Very Difficult	Any comments?
Separating and storing food wastes in the kitchen?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Taking the kitchen waste to the compost unit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Putting yard waste in the composting unit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Tending the compost pile (i.e. turning, watering and removing the compost?)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

10. Please indicate if you have had any of the following problems while composting, the severity of each and whether you were able to resolve them.

	No Problem	Slight Problem	Severe Problem	How resolved, if at all
Assembly of Unit (if applicable)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Odors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Rodents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Flies & Bugs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of Capacity				

Thank-you for Participating in this Study!

	No Problem	Slight Problem	Severe Problem	How resolved, if at all
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lid of the unit not Secure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Too Cold to compost during the Winter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Appearance of Your compost Unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of relevant/accessible composting information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Complaints from Neighbors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other: Specify	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other: Specify	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

11. Have any of these problems been severe enough to make you stop composting?

Yes

No

12. If yes, please list the problem(s) that made you stop composting.

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13. a.) How satisfied are you with the *Lumberlovers* Recycled Wood composting unit?

Very satisfied

Satisfied

Not satisfied

Thank-you for Participating in this Study!

13. b.) Please provide any comments, suggestions or opinions you may have regarding the *Lumberlovers* Composter and how it can be improved.

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14. a.) Have you reviewed the composting informational material provided with the unit?  
 Yes                       No

b.) If yes, how satisfied are you with the composting informational material provided with your unit?

Very satisfied               Satisfied               Not satisfied

14. c.) Please provide any comments, suggestions or opinions you may have regarding the material and how it can be improved.

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15. a.) Did the person(s) who delivered the composting unit provide any of the following services? (Please check all that apply)

- Position the composter in the best possible place
- Provide composting tips on how to get started
- Answer your composting related questions
- Offer contact names & numbers for future composting questions

15. b.) How satisfied were you with the quality of service provided by the person(s) who delivered your composting unit?

Thank-you for Participating in this Study!





	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know (√)
e.) Composting will attract rodents	1	2	3	4	5	
f.) Composting will attract flies	1	2	3	4	5	
g.) Compost takes too long to break down	1	2	3	4	5	
h.) The cost of a compost unit prevents me from composting	1	2	3	4	5	
i.) Its too cold to compost during the winter	1	2	3	4	5	

18. a.) As you may know the cost of your composting unit was subsidized by the Province of Manitoba. The current retail price for this particular composting unit is \$75. If no subsidy had been available and the composting units were sold to homeowners at the retail price, would you still have decided to purchase your composting unit?

Yes (skip to question 18. c.)       No

18. b.) If no, please tell us what retail price you would have been willing to pay for this unit:

\$ \_\_\_\_\_

18. c.) Please provide any comments or opinions you may have regarding the composter subsidy.

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Thank-you for Participating in this Study!

We would now like to ask some personal information that will be helpful to us in comparing your answers to those of other respondents in the survey.

19. Please indicate whether you own or rent your present dwelling.

Own  Rent

20. Into which of the following categories does your dwelling fall?

Single detached

Semi-detached

Duplex

Triplex

Row House

Other – please specify \_\_\_\_\_

21. Which of the following is the language most often spoken in your household?

English  Portuguese

French  German

Italian  Greek

Chinese  Spanish

Filipino  Japanese

Other – please specify \_\_\_\_\_

22. Please indicate the number of people in your household who fall into each of the following age and sex categories

**Males**

Under 20  35-44 years  55-64 years

20-34 years  45-54 years  65 or older

Thank-you for Participating in this Study!

**Females**

Under 20

35-44 years

55-64 years

20-34 years

45-54 years

65 or older

23. Into which of the following categories does the total annual income of all members of your household combined fall?

Under \$23,000

\$33,000 - \$62, 999

\$23,000 - \$32,999

> \$63, 000

24. Please use the space below to provide any additional comments you may have about the bin sale pilot project that you have participated in.

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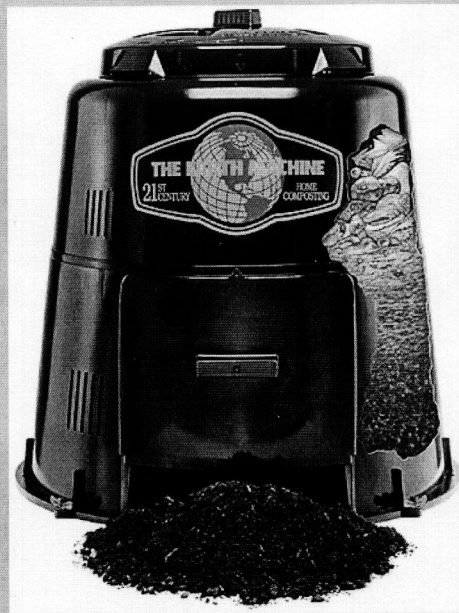
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Thank-you for Participating in this Study!

**APPENDIX H: CITY OF WINNIPEG COMPOSTER SURVEY  
REMINDER LETTER**

**Mailed in Your  
Composting  
Survey Yet?**





UNIVERSITY  
OF MANITOBA

## Natural Resources Institute

Hello Fellow Composters!

303-70 Dysart Road  
Winnipeg, Manitoba  
Canada R3T 2N2  
Telephone (204) 474-8373  
Fax (204) 261-0038

My name is Gerald Villegas and I am a Masters student from the University of Manitoba. Last month I sent your household a survey to get feedback from customers who purchased an Earth Machine backyard composter from the City of Winnipeg in July of 2002. Your household was selected randomly from over 8000 individuals that purchased a composter last summer. I am sending this reminder because I have yet to receive your filled out surveys (as of May 9, 2003).

If you have sent the completed survey in, thank-you very much! You will now be eligible to win some great composting related prizes!

If you have not completed the survey don't worry its not too late! Now there are probably a some very good reasons why you haven't sent the survey back to me yet....

1. **You lost the survey and the return addressed, stamped envelope.** If this is the case please call me at 955-2964 or email me at [composterdeal@yahoo.ca](mailto:composterdeal@yahoo.ca) and I can send you a new one as soon as possible or we can fill it out over the telephone.
2. **You haven't started to use the composter yet.** That's ok! I am very interested to know what motivated you to buy a composter, what has prevented you from starting to use your composter, and what you thought of the City's composter sale. You are just as important to me as someone who has started to compost! Plus, if you have questions, I can help!
3. **You really don't appreciate the questions at the end of the survey.** These questions are only being used to see if there are "demographic trends" associated with customers who purchased a composter. If these types of questions bother you, just remember, you are under no obligation to answer each question. I certainly do not want to anger anyone by sending these surveys out, fill out only what you feel comfortable with.
4. **You just don't have the time to fill it out.** The survey takes about 10 minutes to complete. We all live very busy lives, so I appreciate any time you can devote to filling this survey out. There will be a draw for composting prizes at the end of May 2003 to reward those individuals who have taken the time to complete the survey. This is your chance to give the City some feedback on this program – good or bad.

Please feel free to contact me at 955-2964 or via email at [composterdeal@yahoo.ca](mailto:composterdeal@yahoo.ca) if you have any questions about the survey. Thank-you so much for buying a composter, filling out the survey and helping me complete this project! Your participation will play a vital role in developing effective home composting programs in Manitoba and providing its citizens with the best composting services possible.

Sincerely,

Gerald Villegas  
Master Natural Resource Management Candidate  
Natural Resources Institute, University of Manitoba