

From Garbage to Garden

Bringing Compost and Compostable Products to Macalester College



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Introduction

We often attend gatherings such as picnics, department events, and quick lunches at Macalester with the intention of learning, conversing with colleagues, or enjoying a meal with friends. But one thing we commonly do not consider is the type of plates, cups, and utensils we use at these social events. This lack of realization can be attributed to the general mindset of a severed connection with the environment, one in which we don't register the serious impact that our waste has on the environment. One of the ways you can see this mindset is illustrated through our consumption of plastic. We currently live in a society where plastic has become the default option for disposable goods, and we see this in our use of disposable plate-ware and utensils at one-time events. Macalester College is not immune from this consumption habit. Because we live in a consumerist and materialistic society, waste has unfortunately become a significant part of our lives.

We want. We buy. We waste. Our current infrastructure is set up for disposal. However, there exists alternatives that can lessen the impact of accumulating waste in our daily lives. One highly effective and beneficial alternative is composting, which “has been historically promoted as both the basis of organic method of gardening and farming, and as a waste management technique (Barton, 171).” However, despite the efficiency of composting in regards to softening the blow of our consumerism, the infrastructure of composting is not yet in place at Macalester. Our intention for this report is to elaborate on the benefits of composting, the manners in which we can organize an educational campaign to bring composting to Macalester, and further our zero waste goals.

Our intention for this campaign is to spread understanding of the process in order for student and faculty to utilize this upcoming system. In addition to composting bins, compostable items would not only contribute to soil conditioning, but also reduce the amount of waste produced

by Macalester. We are trying to emphasize the importance of reconnecting with our natural environment and positively contribute to it.

Basic Definition of Composting

Composting is a chemical process. It is a recycling process in which organic materials decompose into soil rich with nutrients. Composting is nature's process accelerated, hurried in order to lessen the amount of waste produced by humans. In the end, the process includes the cycle of returning nutrients to the earth. Plants will continue growing and providing food and then waste will once more be returned to the ground, continuing the cycle of life. (Appendix A)

Chemical Process

The chemical process of composting is known as an aerobic process, meaning that oxygen plays an important role. There are living organisms, such as fungi, worms, and aerobic bacteria, involved in this process. Carbon plays a pivotal role as the major source of energy that is later fueled into carbon dioxide ("Compost Fundamentals"). Nitrogen is another essential element for the process, but not as much as carbon ("Compost Fundamentals"). The living organisms imbibe two thirds of the carbon dioxide. The remaining third of carbon dioxide combines with the nitrogen in the organism's cells ("Compost Fundamentals"). However, if there is too much carbon, it will take the organisms several cycles in order to reduce the amount to a regular level ("Compost Fundamentals"). And once they die, the nitrogen and carbon remaining in their bodies is then used as a source of energy for other living organisms. Then, the next set of living organisms produce new cells that require nitrogen and carbon ("Compost Fundamentals"). The cycle continues.

In other scientific terms, those same organisms essential to the composting process create extracellular enzymes that are a "chemical aura outside the organism's body" (Del Porto et al.).

Those enzymes change molecules (from the organic matter necessary for the process) into energy and other chemicals (Del Porto et al.). The same unstable protein enzymes act as a catalyst for a chemical reaction--decomposition (Del Porto et al.). The decomposition is one of the final steps that lead to nutrient-rich compost (Del Porto et al.).

Composting essentially means that organic matter will become a “soil conditioner” (Del Porto et al.). Now that we understand the scientific aspects of composting, here is what we want incorporated into Macalester’s Zero Waste efforts:

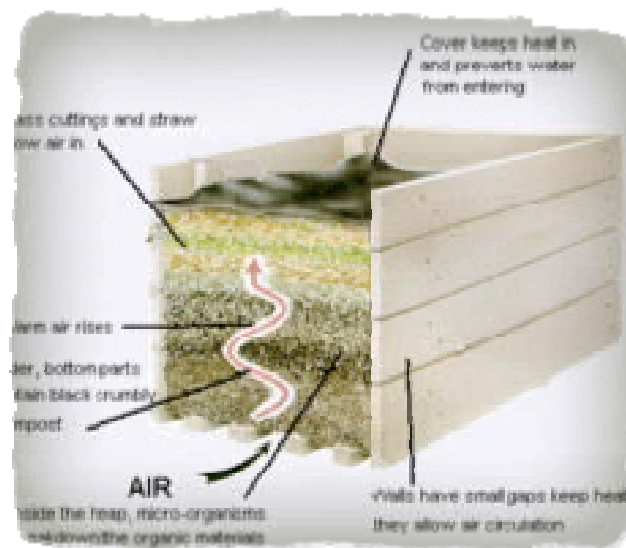


Figure 1: Chemical Process of Composting.

Environmental Benefits

There are several benefits to composting. The first is that because “yard and food waste make up thirty percent of waste stream” (“What is Composting?”), people can bother using alternatives instead of simply throwing away their yard and food trash to reduce that high percentage. It is especially important now because in the eighteenth and nineteenth century, farmers had “this open-ended system crops [where they] removed minerals from the soil [and]

returned nothing to make up the deficit” (Barton, 172). And now, by composting, we are adding organic matter into the soil that

provide[s] food for the soil organisms whose activities bring into solution the minerals which are present in abundant quantities in the rock particles in nearly all soils, thus making these substances available to plant life (T. Stamm, 940).

By adopting more environmentally conscious habits, people are actually helping the environment recuperate from past indiscretions. Composting does not necessarily transfer directly to plants--from compost to plant--but includes a middleman, the “soil organisms” (T. Stamm, 940) that make the benefits possible. By supporting the composting process, we are actually helping improve the negative impacts of our past habits.

Social Benefits

Adding nutrients to garden plants increases the healthiness of your diet, which increases the quality of your own health. Compost contains a mixture of nitrogen, phosphorous, potassium, sulfur and carbon (“Nutrients in Compost”), all of which contribute to a plant’s health. Iron, Zinc, Copper, Boron, and Manganese, which are considered micronutrients, are also present during the process that enriches soil and helps plants become healthier. By consuming healthier and more nutrient-rich plants, society as a whole becomes healthier. Society has adopted the trend of wanting healthier food and being healthy, so composting would become more socially acceptable. And once it is more socially acceptable, a major social benefit of encouraging composting is changing people’s mindset about the environment, which is crucial to reducing waste in the future. If composting becomes an ordinary component of your daily habits, then it will become more natural to be environmentally friendly. It would be as natural as Minnesota Nice. The more integrated composting is in your life and the more it is commonly used is crucial to it changing

people's current mindset about food waste. Thinking about the waste cycle and our involvement, we have begun to acknowledge the manners in which we can act more sustainably and assess our social and ecological impacts.

Commercial Composting at Macalester

Commercial composting is an “alternative to landfills” (NCEDR) that reduces waste and capital used towards its management. “Waste haulers and organic waste generators” are used to send material to a composting facility that will recycle it into “soil amendments and other value-added products” (NCEDR). Whereas in landfills, the majority of methane intended to be captured for energy usage is released too early, commercial composting “improves the quality of our soil and reduces the need for chemical fertilizers and pesticides”. Composting in your backyard is helpful, but the commercialization of the process allows for a wider breadth in practice.

Eureka Recycling is the company with the greatest likelihood of developing a commercial composting system at Macalester should official decide to move forward on this plan (Make dirt Not Waste).



Figure 2: List of What Can and Cannot be Composted

Recommendations

In specific reference to the Macalester campus, we hope that despite whichever waste company is used, we hope that a new composting culture is born in residential halls and academic buildings. The future for commercial composting at Macalester is undetermined (but looking bright). We hope that our recommended strategies can be used to help engage and educate students and staff regarding the importance, process, and benefits of composting. We are still unsure of which company we will work with, but our strategies can be put into effect regardless of the company and serve as a framework for composting outreach. Despite the possibility that composting may not be implemented on campus, we have included additional information on backyard composting (Appendix B) in order for personal usage. However, we strongly recommend that commercial composting is adopted in order to better our campus. We hope that by merging all of this information into one document, we can illustrate the benefits and the effortlessness with

which composting can be accepted. Commercial composting is not a burden that disrupts out daily habits, but a small additional step to what we already do. We want this to become a pervasive culture of conscientious waste disposal. We have no doubt that students or workers can cooperate with facilities in order to properly empty out the composting bins from student lounges and the main offices of the different departments in academic buildings. Here are some of our recommended promotional events and educational initiations that will strengthen the welcoming and enforcement of commercial composting.

Educational Campaign Recommendations When Macalester Decides to Implement Commercial Composting on Campus

- Tabling:** This would be a great initial step in educating the student body and faculty. This initiative could be taken even before composting starts and act purely as a preface to further educational campaigns. A group of students could set up a table in front of the campus center or downstairs with various posters outlining the process, importance, benefits, and food that can be composted. In addition to visually-stimulating posters, one should have several smaller pamphlets and brochures to hand out. Another possibility would be giving people stickers with the compost symbol on it so that they become more aware of the meaning behind the symbol and possibly start a social trend of having these sticker designs. You can reserve a table for publicity and outreach in the basement of the Campus Center or outside of the Campus Center.

Example Sticker Ideas:



Figure 3: Composting stickers used at the University of Oregon

- Compost Kick-Off Event-** This is an interactive method to educate students. This event would occur either right before the implementation of commercial composting here on campus or at

the initial phase of the composting. At this *kick-off event*, which could be sponsored by the Sustainability Department or any other interested departments and organizations, we could have a table set up in front of the Cafe Mac with pledges that people could sign saying “*I commit to composting*”. After the event, one could place the list of names in a public space say in front of the campus center. The Health and Wellness Center did something very similar with their *Consent is Mac* pledges. This public commitment strengthens the individual’s likelihood of actually composting because he/she made the commitment in a public space where his/her friends saw them make the it, adding pressure for them to abide by the pledge. At the same table one could have whiteboards or posters that say “I compost because . . .” and the individual could fill in the blank and then take a photo. Then these photos could be placed in a public space where students could learn more about why it is important to compost. This initiative would help get the word out about composting and make it become more of a social norm.

In preparation for this event here are some small steps one can take:

- Chalking:** Making chalk announcements on the sidewalks is a *great* way to get some attention. Chalk is available in the SORC (Northeast end of the Campus Center 2nd floor).
 - Banners and large posters:** You can request to have a banner or large poster be hung along the Cafe Mac rafters. Reserve ahead of time at the Reservation desk, open 8-4:30, Mon-Fri. 651-696-6638.
 - The Daily Piper:** Submissions to The Daily Piper must be made at least one business day in advance, and each submission may appear up to two times. Electronically submit an update at: <http://webapps.macalester.edu/dailypiper/submit/>
- Educational Photo Gallery- Another visual method you could employ would be organizing a photo gallery in the display cases on the second floor of the campus center of the individuals holding their signs at the Kick-Off Event. Reserve space in display cases in basement of Campus Center, near SPO area. Reserve through Reservations desk, x6638.
 - Stickers-At this event--or leading up to it--we would like to create compost stickers and distribute them to those who took pictures of them holding up signs of their commitment to composting. A budget is required.
 - Residential Life- An important step in connecting with the larger student body (mostly freshman and sophomores). Contacting Residential Affairs (Peggy Olson) would be a very effective initiative. Students who are passionate about composting could visit the once-a-month floor meetings, ideally the month before composting starts on campus. Student trainers would introduce what composting is, its process, and its benefits. This could be another interactive initiative in getting the students involved and asking them what they understand about composting. Do a quick presentation of the importance and benefits of composting and see if we can get floor members to sign a pledge saying that they will commit to composting, much like the Health and Wellness Center did with *Consent is Mac*. It is important that when a composting system is set in place that there is clear labeling on the bins so that they are properly used. Students will learn how they look by attending these floor meetings.



Figure 4: Composting bins at NYU residential hall

- Connect with Existing Student Organizations-Would be very helpful to create a core group of students who could lead this initiative in hosting these various composting educational campaigns. There are numerous active environmental organizations here on campus that would be great resources and forces for this campaign. Some organizations that have expressed interest are MacCares, MPIRG Environmental Task Force, the newly formed Food Roots, and MULCH. This would be a great opportunity for organizations to collaborate and have more comprehensive and powerful impacts.
 - o **MacCARES:** A student organization and movement that embodies a million different sustainability projects on and off-campus. Organize a meeting with MacCARES members, send an email to maccares@googlegroups.com
 - o **MULCH:** Macalester Urban Land and Community Health is a student urban gardening organization that runs the MULCH garden on campus. The MULCH email address is mulchgarden@gmail.com
 - o **MPIRG:** The Macalester chapter of the Minnesota Public Interest Research Group has an Environment Task Force.
- Facilities- We have been in contact with Mark Dickinson as well as Ralph Williamson, the Custodial Manager, about meeting with them in order to familiarize ourselves with the ongoing process of bringing commercial composting to Macalester. It is essential to maintain a student voice when composting comes to campus so we can help make informed logistical decisions of where to place the compost bins.
- Informational campaigns: Have informational packets, pamphlets, and brochures available to students. Here is an example from the University of Santa Clara:

COMPOST	RECYCLING	WASTE
<p>ALL food fruits, vegetables, bread, meat, fish, dairy</p>  <p>Bon Appetit To-Go containers, plates, utensils, napkins, cups, straws</p>  <p>Coffee/Tea tea bags, coffee grounds & filters, wooden stir sticks</p>  <p>Pizza Boxes</p>  <p>Old Flowers</p> 	<p>Paper (All types)</p>  <p><i>Custodian empties weekly</i></p> <p>Aluminum</p> <p>Glass</p> <p>Plastics #1-7 Check for a triangle on bottom of the container</p>  <p>Cardboard</p>  <p><i>Place flattened, near any recycling bin</i></p> <p>Universal Waste Batteries, light bulbs, cell phones, ink cartridges</p>  <p><i>Send to Facilities via intercampus mail</i></p> <p>Electronic Waste Items with an electric cord or batteries</p>  <p><i>Contact Facilities to request a pick up facilities-csc@scu.edu or x4742</i></p> <p>Paper Only paper No books or other recycling please.</p>  <p><i>Located at copiers & printers</i></p>	<p>Packaging Wrappers for candy, chips, energy bars, condiments</p>  <p>Non-SCU Disposable Containers Cups, take-out containers, Styrofoam, soiled aluminum foil</p>  <p>Plastic Bags Grocery, zip-top, produce bags</p>  <p>Paper Towels</p>  <p><i>Please empty into the nearest common waste container, as needed</i></p> <p>There Is No AWAY... <i>When we throw our "garbage" away, we send it to a landfill. Please help SCU use resources efficiently and divert waste from landfills:</i></p> <ul style="list-style-type: none"> • Reduce the stuff you consume. • Reuse as much as you can. • Recycle and Compost where possible. • Respect others in our community, our watershed, and natural resources by learning more.
<p>Quick hints:</p> <p>#1 Please compost anything that was once alive, or was made of living materials.</p> <p>#2 Please no plastic, metal, or glass in the compost.</p> <p>#3 Look for these labels on the bottom of your container</p>  <p>"Nature Works"</p>	<p>Have a question? Please e-mail recycling@scu.edu www.scu.edu/sustainability 2011</p>	

Figure 5: Composting poster used at Santa Clara University

•Staff Contacts

- o **Academic Office Professionals:** The Academic Office Professionals are staff members who work in the academic offices. Contact are the co-chairs are Patty Pfalz at pfalz@macalester.edu and Jeanne Arntzen at arntzen@macalester.edu
- o **Zero Waste Committee:** The Zero Waste Committee works towards reducing waste and increasing recycling on campus. Contact: Suzanne Savanick Hansen (shansen2@macalester.edu)

If you are also passionate about bringing commercial composting to campus, contact these officials to make your feelings on the subject known. Also contact the Sustainability Office. We cannot determine the time it will take in order for the infrastructure to allow for commercial composting on campus, but in the meanwhile, the most logical step is bringing compostable products to Macalester. Here is how that can be done:

Bringing Compostable Products to Macalester

Once the composting infrastructure is in place we can further strengthen our sustainable habits by using alternative disposable flatware. Currently there is a vast range of detrimental environmental effects that are caused by the overwhelmingly slow degradation of plastic. One initiative we can take, as a campus to improve our sustainable behaviors is to switch from plastic disposable plates and utensils to compostable plate-ware and utensils. This paper offers concrete and coherent reasoning for the use of alternative disposable options and highlight a few companies who are spearheading this newly established compostable product market. There is no fix-all solution to our over-consumption, but using compostable items is a small step in the right direction of more sustainable consumption and behaviors.

Negative Impacts of Plastic

Plastic disposable goods are often used at Macalester events, because of low cost and convenience. In general Americans throw away an estimated trillion disposable plates and utensils every year. This is an overwhelming number especially when taking into account that a single-use plate's useful life generally averages only about five minutes (Caplan, 2008). Apart from the predicament of the overuse of plastic, another problem of plastics is that they never fully biodegrade. No natural process can break it down. Plastics are made from polymers that are “man made thermoplastic polymers (Silverman, 2007).” Rather plastic photo-degrades- a process where each piece of plastic will break into smaller pieces without breaking into actual simpler compounds. This process alone scientists say can take several years. Although we often try to recycle our plastic plates, cups etc, many end up in landfills and can cause huge environmental damage both on land and in the sea. Marine animals will often ingest the plastic and poison

themselves. In addition to the damage caused by plastic, the plastic particles absorb high chemical concentrations and are later consumed by organisms, which fundamentally disrupts the flow of the food chain (Silverman, 2007).

There are undoubtedly vast environmental impacts of using plastic, but the social environment of our consumption habits has allowed plastic to monopolize the disposable goods sector (Caplan, 2008). We commonly have this mindset that when we throw away our plates or cutlery that this signifies the termination of our interaction with the item, that this is the end of the products life and existence, but this is not true. We don't consider the decomposition process and how the product reintegrates into nature. It is our responsibility to take into account our lifecycle of throwaway goods in order to apply what we learn in a respectful and empathetic way that encourages sustainability and conservation.

Compostable Products

Currently there is a push within the disposable goods market for more environmentally manufactured products. A great diversity of materials and sources is used in the compostable disposable goods market. There are several potential benefits of using compostable disposable goods including reducing green house gas emissions, and lessening our landfill waste. By switching to using compostable items we grow cognizant that our resources are finite and recognize our responsibility to be more conscientious consumers.

The development of compostable products is relatively new, originating around the 1990s, but this industry has matured over the years. In North America, the Biodegradable Products Institute (BPI) is the epicenter for tracking products and providing compostable certification. The BPI has a third party certification process that analyzes and sees whether or not manufacturers'

products meet the ASTM (American Standards for Testing Materials) definition for compostability, meaning that products will compost in a certain time frame. Products that have gained BPI certification carry the logo on their products and are completely compostable.



Figure 6: BPI Compostable Label

Two different specifications for products exist: the ASTM D6400 (applies to products made from plastics that are designed to be composted in commercial composting facilities) and ASTM D6868 [applies to laminated paper, Plant Starch, and sugarcane (bagasse) items that are designed to be composted in commercial composting facilities (Yepsen, 2008)]. These specified certifications are integral in guiding Macalester to choose the appropriate compostable products and company. BPI's website currently has 27 companies approved for making sustainable foodservice items and packaging films (Yepsen, 2009). Compostable products are now in effect growing in numbers and popularity, but there is still a long way to go.



Figure 7: ASTM Certification logo

ASTM D6400	ASTM D6868
<p>“Certification establishes standards for identifying plastic products and materials that will compost satisfactorily in municipal and industrial aerobic composting facilities. Specific properties are required to determine if these plastics will compost satisfactorily, including biodegrading at a rate comparable to known compostable materials and that the degradation of these materials will not diminish the value or utility of the finished compost.”</p>	<p>“Certification has similar standards to ASTM D6400, but covers materials and products (including packaging) that incorporate a biodegradable plastic film or coating (either through lamination, extrusion or mixing). It ensures any entire end product that is designed to be composted in municipal and industrial aerobic composting facilities will compost satisfactorily.”</p>

Figure 8: Definitions by the Biomass Packaging Certification and ASTM page

<http://www.biomasspackaging.com/education/Certifications/>

Although there are many who know about composting and understand the importance of diverting waste from landfills, and all of the benefits, most people in the U.S., still don't understand composting (Yepsen, 2009). It is essential that Macalester chooses the most sustainable and ethical company with the BPI compostable logo, and not one that falsely advertises and markets their products as solely biodegradable because biodegrading only occurs under specified conditions. A study focusing on the definition of compostable products was done by the American Chemistry Council; it surveyed consumers to find out what their definition of compostable was and highlighted some of the benefits of compostable products. Their study cited that most participants felt that the “chief attribute of compostable materials is that the decomposition is beneficial to the earth which stands in opposition to their biodegradable beliefs that materials simply disappear completely” (Genpak). Therefore, compostable disposable products are

inherently better than mere biodegradable products because they naturally act as better additives to the soil and should be our disposable item of choice at Macalester. Compostable products reduce pollution and waste, require less energy and water to produce, come from renewable resources, are created from waste products, and save biodiversity and habitats (World Centric). There seems to be endless benefits of employing compostable products in our departments.

Important Definitions brought to you by the BPI Website

- **Biodegradable Products Institute (BPI):** is a not-for-profit professional association of key individuals and groups from government, industry and academia. They create a universal compostable label program, where they educate manufacturers, legislators and consumers about the importance of having scientific based standards for compostable materials which biodegrade in large composting facilities.
 - **ASTM D6400:** Test done by Bpi to certify if a product can be truly composted
 - **ASTM D6868:** Test to determine if a biodegradable plastic is truly biodegradable
- **Recyclable:** Are products that can be collected and reprocessed to produce new items. Common recyclable materials are: paper, cardboard, plastic, glass, aluminum, and electronic waste. Recycling is very important in diverting waste from landfills.
- **Biodegradable:** Biodegradable simply means that a product will break down into carbon dioxide, water and biomass within a reasonable amount of time in the natural environment. The term 'biodegradable' however has no legal enforcement or some manufacturers have used definition therefore the term loosely. Products that are labeled as 'biodegradable' can be disposed of in your garbage. However it is important to remember that landfills lack the microorganisms and oxygen required for waste to biodegrade in a timely manner, so you should still try to minimize the amount of wasted material. (The Green office definition)
- **Compostable:** A product that is “compostable” is one that can be placed into a composition of decaying biodegradable materials, and eventually turns into a nutrient-rich material. When something is "compostable", it means that it is made of organic matter that will break down in a compost system or landfill.
- **Compostable vs. biodegradable:** Compost friendly items include organic matter that easily break down, while biodegradable items are capable of decomposing at some point but usually need help from biological agents such as bacteria to do so.
- **Biodegradable Plastic** is plastic, which will degrade from naturally occurring microorganisms, such as bacteria, fungi etc. over a period of time. Note, that there is no requirement for leaving "no toxic residue", and as well as no requirement for the time it needs to take to biodegrade.
- **Bagasse** is sugar cane fiber pulp, left after the juice has been extracted from the sugar cane stalk. Bagasse is normally seen as a waste product and incinerated, thus creating air pollution. Making tableware out of residual sugar cane fiber actually decreases air pollution □and adds value to the material. (World Centric definition)

- **Biodegrade** - break down into carbon dioxide, water and biomass at the same rate as cellulose (paper).
- **Disintegrate** - the material is indistinguishable in the compost, that it is not visible and needs to be screened out.

Now that we have researched the scientific and company aspects of composting, we wanted to see how widely accepted it would be by departmental heads and staff officials. Here is what they told us:

Departmental Responses

After speaking with the Department Coordinators on November 1st at the AOP meeting, many people showed interested in the notion of switching over to compostable items for events and gatherings. The main concern they expressed was having the financial support of Macalester in case of an increase in price. I spoke to Kathleen Johnson, the bidding manager, and she expressed interest in supporting the departments' switch-over to compostable items. However, it will be necessary for the department coordinators to meet with Kathy Johnson at some point to work out the logistical details. I spoke with numerous department coordinators who expressed interest in using compostable items once commercial composting was available here on campus. Other than their worries of financial support, the only hesitancy they expressed was aesthetics. They were worried whether or not it would look as nice. I responded that I would show them a variety of types of materials and that compostable plate-ware is very durable and aesthetically-pleasing.

Departments	Question 1	Question 2	Question 3
Psychology and Neuroscience	\$4,000	Yes interested in switching over.	Buy products from Sam's Club.
Theatre and Dance	\$1,500	Use plastic silverware and clear plastic cups for fancy events, but use compostable items for everything	Use paper plates and napkins. Use plastic for big events. Have no dishwasher or water to wash dishes. Not available in Humanities.
Biology	\$3,000	Yes would switch as long as there is a good system in place	Use ceramic mugs, metal flatware and plastic plate and paper napkins for small events.
Anthropology	Try to keep costs \$13 and less for their two major events. They spend \$50 on disposable for spring department picnic	Yes interested in switching over. interested to hear about the cost of compostables.	Use china for major events and disposables for picnic.
History and Classics	\$500 for disposable or reusables, most of the money goes to consumables.	Would like to switch to reusables, but they do not have a washer. As of right now not interested in compostables because they think it costs more and would be thrown away	Buys bulk packages of plastic ware from Costco.
Environmental Studies	\$1,000-\$1,500	Yes they are very interested	Use plastic cups only and sometimes plastic flatware.

Figure 9: Departmental Reactions to Compostable Products

Quickly after this discussion, we compiled a list of both local and online vendors that were BPI-certified and could be used at Macalester. We thought that these were reasonably-priced, especially for small events. Here is a succinct table including their websites:

Recommended Online BPI Certified Vendors

Company	Contact Information	Base Location	Website
Biospheric Industries	Elie Helou (elieh@biosphereindustries.com) 805-566-6563	Carpinteria, CA	http://www.biosphereindustries.com/
Eco Products 	Luke Vernon (lvernon@ecoproducts.com) 303-449-1876	Boulder, CO	www.ecoproducts.com
World Centric 	Aseem Das (aseem@worldcentric.org) 650-283-3797	Palo Alto, CA	www.worldcentric.org
GeoTegrity/Far East Eco Pack 	John Ohman (John.Ohman@fareasnaturalpackaging.com) 612-326-6588	Long Lake, Minnesota	http://www.geotegrity.com/
Verterra Ltd. 	Michael Dwork (Michael@verterra.com) 718-383-3333	Long Island City, NY	www.verterra.com
Vegware Ltd. 	Craig Schuler (cschuler@vegware.us) 860-779-7970	Danielston, CT	www.vegware.us
Ultra Green	Jere Clue (jere@ultragreenhome.com) 763-746-3345	Plymouth, MN	http://www.ultragreenhome.com/

Recommended Local Stores to buy Compostable Products

Store	Address
Whole Foods	30 S Fairview Ave St Paul, MN 55105 651-690-0197
Mississippi Market	622 Selby Ave. (corner of Selby and Dale) St. Paul, MN 622 Selby Ave. (corner of Selby and Dale)
Seward Co-Op	2823 East Franklin Avenue Minneapolis, MN 55406 612-338-2465
Linden Hills Co-Op	3815 Sunnyside Ave Minneapolis, MN 55410- 1353 612-279-2479
Kowalski's Market	1261 Grand Ave. St. Paul, MN 55105 651-698-3366
Johnson Paper & Supply Co.	806 14th Ave. N.E. Minneapolis, MN 55413 612-333-6308

Because Bon Appetit at Cafe Mac produces the most waste, they could benefit the most from using compostable products. We have included a plan for Cafe Mac:

Bon Appetit and Compostable Products

With these options available it is important to investigate companies that Bon Appetit could utilize in the future and learn whether or not they would be cost-effective. It is undeniable that Bon Appetit at Café Mac engages in many sustainable activities. We dispose of our food waste to a local pig farm and use recycled napkins. However, we do have a lot of room for improvement in

the area of sustainable disposable products. I have been in contact with Kimberly Driesch Manager of Café Mac and she provided me with some information regarding how much money Bon Appetit spent on disposable last year. Last year, first semester, Bon Appetit spent \$10,646 on paper products at the grill. They get their supplies from the large based company Sysco. This figure shows how much Café Mac is spending on disposable goods and depicts the low prices that they are able to get their disposable goods at. Bon Appetit currently gets their plastic and paper goods from Greenware and Fabrikal. We are currently in the process of seeing if they could supply through Sysco a lower price for compostable items. If this is not possible, we researched further ethical and sustainable companies that even though at a higher price could supply Bon Appetit with high quality compostable goods.

Bon Appetit Hot Cups	Clear Plastic Cups	Parfait Cups
• 12 oz - \$.06	• 12 oz - \$.07	• Parfait Cup - \$.07
16 oz - \$.07	20 oz - \$.09	Parfait Insert - \$.04
Lids - \$.03	Lid - \$.03	• Insert Lid - \$.03
Sleeve - \$.11		Cup Lid - \$.03

Figure 10: Paper good Prices from Sysco

Numerous ethical and sustainable compostable manufacturers exist that are pioneers of this sector. Two companies that epitomize a green mindset are World-Centric and Eco Products, both of which have BPI-certified products. World Centric is located in California and was founded in 2004 with the mission of raising “awareness of large scale humanitarian and environmental issues and to promote sustainable alternatives to every day consumption choices (World Centric).” Their

products are made from resources like corn, sugarcane, and wheat straw fiber, which are often by products of the agriculture industry. What makes World Centric unique is its dedication of holding high work and environmental standards. They support grassroots environmental organizations and run their offices with renewable energy (wind and solar). World Centric’s ultimate goal is striving to be a Zero Waste office. This company exemplifies sustainability. They provide \$250 per month reimbursement for employees to take public transportation. They gave nearly \$40,000 in 2009 to notable environmental charities that contribute toward a more sustainable and economical way of life in India, Kenya and North America. They provide Compostable lunch trays at lowered cost to schools to replace Styrofoam trays with a total donation of over \$126,000 in 2009. They recognize that “a key part of being a leading supplier of compostables in the industry is also recognizing that our every action in making compostables has a consequence (World Centric)”.

They are constantly searching for ways to make their companies operation more sustainable and environmentally friendly. World Centric Biocompostables can help reduce the impact of our consumption on the environment and more specifically Macalester’s waste footprint. World Centric’s website was very well-designed and transparent and encouraged consumers to not only use compostable products, but also to engage in other sustainable behaviors with the page called “Actions to Take.”

Product Name	Quantity	Price
12 oz Cold Cup	Case of 1000	\$112.58
Lid Clear Cold Cp 10-24 oz	Case of 1000	\$55.29
12 oz Hot Cups	Case of 1000	\$104.54
Bagasse 9 inch Round plate	Case of 1000	\$112.58
12 oz Barrel Bowl (unbleached)	Case of 500	\$40.19

Figure 11: Potential World Centric Compostable Products Pricing

Another company I found to be one of the most revolutionary and sustainable was the Energy Star Rated company, Eco Products. They launched a Life Cycle Assessment of their products and operations to analyze what their impacts were as a company. They measured and tracked environmental impacts like carbon, energy and water that go into their raw materials, manufacturing, transportation, shipping, and distribution. This assessment allowed the company to be very transparent and gain a more profound understanding of how to continue to better their practices and fundamentally show that manufacturing compostable items is far less energy intensive than producing plastic. The company states on their website, that “When you can't go with a reusable option, we want you to consider a compostable product made with renewable resources or one made with post-consumer recycled content. Any opportunity to support waste diversion is a good opportunity (Eco Products).” They are always striving to produce more of their products domestically, but are in the process of this conversion.

Eco Products color code their products: Greenstripe products are made from renewable resources like bagasse/sugarcane, polylactic acid, and plant starch and the Bluestripe products are made from post-consumer recycled content such as recycled fiber, recycled plastic, and recycled polystyrene. They have a chart that provides a clear distinction and reasoning for using these alternative products. They also include information about the strengths and weaknesses of every single type of resource that they manufacture their products from really encouraging this sense of transparency as well. The website is very interactive and even offers a way to locate composters in your neighborhood. These two companies are just a few great examples of this new and emerging environmental disposable product sector, a market that encourages people to think about what they dispose of and the implications of this action. There is still a lot of research needed analyzing the benefits and limitations of this market, but these two examples attest to the beginnings of a

remarkable and beneficial new market.

Examples of Potential Eco Products Pricing

Product Name	Quantity	Price
12 oz Corn Cold Cup	-1000 cups (20 packs of 50) -Heat tolerance 105 (F)	\$115
24 oz Corn Cold Cup	-1000 cups (20 packs of 50) -Heat tolerance 105 (F)	\$156.41
Flat Lid for Corn Cold Cups	-Case Count: 1000 lids (10 Sleeves of 100) -Does not fit 7 or 10 oz cup -Fits 9 - 24oz Eco-Products corn cups -Heat Tolerance: 105 (F)	\$74.79
12 oz World Art Soup Container-Case	- Case Count: 500 containers - Lids: Sold separately - Heat Tolerance: Hot foods	\$82.90
12 oz Eco Hot Cup	-Case Count: 1000 cups (20 sleeves of 50)	\$115.77
9 inch round plates 6 inch	Case Count: 500 plates (10 packs of 50)	\$57.39
Plantware High-Heat Cutlery Kit	-Each kit consist of 1 each, napkin (1 ply - 13"x13"), fork, spoon and knife -Case Count: 250 individual kit units -Heat Tolerance: 200 (F)	\$78.62

Throwing something away is a simple action that has complex impacts on both humans and the environment. Our every action has an impact on the well being of our planet and our everyday decisions can help create a better world for all. By switching to compostable silverware and utensils in departments, events, etc we as a campus are thus taking an appropriate step in enhancing our sustainable image and practices. Let us walk the walk and not just talk the talk.

There will undoubtedly be environmental, economic, and social benefits of using compostable products. Compostable products are an ecologically important sector, not only for waste management but also for sustainable agriculture practices. Let Macalester be apart of this change and switch our plastic plates and utensils to more sustainable manufactured and processed compostable disposable goods. There is no better time than now.

Conclusion

The journey of bringing composting here on campus has been arduous, but along the way we have encountered many people who have been helpful and informative. Making real, lasting changes in an infrastructure takes not only activism from students, but also relies on the good faith and support of the staff that is part of this infrastructure. The story of composting has been ridden with challenges, bureaucracy, and sometimes an inability to create momentum. This experience for the both of has taught us a lot about the importance of being persistent and not giving up on our project. We hope that this multifaceted report is not ignored or forgotten, but will lend strategies, insight, and newfound appreciation for composting. We are passionate about composting. We did not write this report for it to be filed away, but instead utilized in the implementation of composting and its educational campaign. We urge Macalester College to not lose sight of what is important in the fight to bring composting to campus. Don't let money dictate environmental costs. If money is our chief restriction and concern, think about how we are currently using our money. The money that is being used for the ice rink could be easily be utilized here.

Appendix A

Additional Information for Making Compost at Home

The first step to composting is gathering the right ingredients by knowing what will and what won't compost (Fig. XXX).

There are several steps for making compost.

1. If you are not using bins, place your compost pile on the ground. Organisms, such as worms, necessary for the process will be attracted to the pile (Del Porto et al.)
2. Once you have placed the appropriate materials on the ground, lay straw and twigs over it in order to "aerate" the pile (Del Porto et al.).
3. You must then alternate your composting layers with moist and dry. Moist ingredients classify as "food scraps, tea bags, seaweed, etc." and dry materials classify as "straw, leaves, sawdust pellets, and wood ashes." When dealing with wood ashes, sprinkling them helps avoid clumping and the slowing down of their breakdown (Del Porto et al.).
4. Adding manure as the next step speeds up the process.
5. Throughout these steps, be sure to keep the pile moist, whether by watering it or allowing the rain to keep it soaked. (Del Porto et al.).
6. Also, in order to ensure continual moisture and heat, cover the pile with plastic, carpet, wood, or anything accessible (Del Porto et al.).
7. Now that the pile is complete, be sure to turn it over with a shovel to aerate it.

Appendix B

Different Types of Composting

There are also three different types of composting--backyard, worm, and grasscycling. Backyard composting describes the accessibility of technology to make compost within your own home. As long as there are browns and greens, everything necessary is there to reuse waste. Worm composting, also known as vermicomposting, is the usage of scraps of food to feed to plants due to a small living arrangement. This is best when people live in apartments without backyards and access to greenery. Grasscycling composting is leaving grass clippings on lawns in order for them to specifically decompose there (Del Porto, David and Steinfeld, Carol).

Enclosed Composting Bins

Using bins is an effective way for reducing waste in households. Leftover food and compostable items are placed in these composting bins, waiting to be turned into compost. You can make one out of an old garbage bin by drilling holes (with diameters of one and a half centimeters) fifteen centimeters apart (Del Porto, David and Steinfeld, Carol). The can must be full with materials high in nitrogen and carbon. Stirring the materials avoids pockets of air and makes the composting process faster (Del Porto, David and Steinfeld, Carol). It is the same concept as composting piles, with the exception of having everything sealed inside a container.

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