



## TerraCycle, Inc.

In 2001, during his freshman year at Princeton University, Tom Szaky did what many college students do: he took a road trip to Canada. While visiting friends, Szaky saw something that inspired him: a box full of food scraps and worms. After seeing firsthand how worms could eat garbage and produce a nutrient-rich fertilizer, Szaky, who had started four businesses prior to arriving at Princeton, began to brainstorm with his freshman roommate, Jon Beyer. If worm poop was great for plants, why couldn't they sell worm poop to everyone in North America? After all, the multi-billion dollar fertilizer market had yet to witness a major organic player and the world certainly wasn't short of garbage. So Szaky did what any other logical person would do: he dropped out of Princeton, borrowed \$20,000 from family and friends, and focused his entire life on developing a prototype that would prove that the worm poop model could work.

The summer after their freshman year, Szaky and Beyer purchased a vermicomposting machine and, with Princeton University's blessings, shoveled through dining hall garbage, testing different mixes and blends of waste and feeding them to the worms. Two frustrating months later, with no money in the bank and nothing to show for their efforts but rotting garbage and thousands of red wiggler worms, TerraCycle looked like it may have been nothing more than a summer fling.

But just when they were ready to call it quits, Szaky and Beyer received a phone call asking if they were interested in being interviewed by a local radio station. They accepted the offer as somewhat of a final hurrah and went on the air to talk about their experiences shoveling garbage. Fortunately for TerraCycle, a Princeton resident who happened to tune in was inspired by the story, so much so that he decided to invest \$2,000 into the business—just enough to keep it afloat. After this experience, the two co-founders realized the importance of raising funds to keep the idea alive.

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To do this, they wrote a business plan and entered small business-plan competitions in New Jersey and around the country. This process focused their research and development efforts and forced them to develop other areas of the business model, including packaging, marketing, and sales growth. During this process, Tom Szaky made the decision to drop out of Princeton following his sophomore year.

## **The Evolving Strategy**

The issue of packaging was particularly pressing, because even if Szaky and Beyer's efforts to create a consistent, well-performing fertilizer were successful, they would not be able to sell the poop if there was no way to package it. The question became: how can we package TerraCycle products in the cheapest, easiest way? At first, they attempted to package the products in generic plastic bottles, but purchasing packaging was both expensive and unfulfilling. Then came TerraCycle's next big breakthrough: why not package products with the same packaging that had been used for other products? Once the contents of soda bottles had been consumed, the containers were no longer useful and were often thrown out.

Of course, the problems related to this idea were evident: Bottles came in many different shapes, sizes, and colors. Even if they could identify a consistent bottle size and shape, how would they obtain enough of them? While thinking through these problems, the cofounders of TerraCycle discovered that all 20-oz bottles, whether they were Coke or Pepsi products, had the same cap size as well as the same diameter and circumference at the bottom.

In 2003, TerraCycle beat 750 contestants from business schools around the country to win the annual Carrot Capital Business Plan Competition. The prize was \$1 million in venture capital funding. TerraCycle had roughly \$500 in its bank account, had yet to receive any venture capital funding, and had only raised about \$20,000 in capital from family friends, a few angels, and some smaller business-plan competitions. The company had yet to license its flagship product, had next to no sales, and was little more than an idea at the time. Carrot Capital offered \$1 million in venture capital funding, contingent on management changes and the understanding that TerraCycle move away from using garbage as its packaging. Essentially, Carrot Capital hoped to build a plant-fertilizer company that specialized in organic products, but nothing beyond that. Szaky turned down the deal in favor of continuing to pursue the TerraCycle vision on his own terms.

The next question that arose concerned marketing: how would TerraCycle reach its potential customers? Purchasing ads was expensive and inefficient. Without brand recognition for such a highly unique product, TerraCycle had to think of creative ways to expand the company's visibility. The company decided to develop an education-based program that focused on the enormous waste problem facing the United States and the growing need to reuse and recycle.

The program itself was simple: After receiving approval, a TerraCycle employee would travel to various schools and lead an assembly that educated students about the benefits of recycling and, to the children's delight, discussed the uses of worms and worm poop. In exchange, the school would host a 20-oz recycled-bottle drive, followed by a TerraCycle fundraiser. Inevitably, the program would generate press coverage in the respective communities in which it took place. Even more surprisingly, the children seemed to appreciate and understand the TerraCycle concept. As TerraCycle blanketed hundreds of New Jersey schools with the program, the company began to grow; soon TerraCycle began appearing on shelves throughout the Northeast, and not just New Jersey.

Indeed, thanks to the mix of college dropouts, its unusual worm poop products, and its eco-capitalist business model, TerraCycle was very successful at attracting media attention. *The New York Times*, CBS News, CBC News, CNN, *The Washington Post*, *TIME* magazine, and the Associated Press all covered the TerraCycle story.<sup>1</sup> Not surprisingly, TerraCycle also had a strong grassroots following across college campuses and eco-conscious communities throughout North America.

Simultaneously, TerraCycle was having tremendous success pursuing big-box distribution in Canada. Small-store sales in Canada demonstrated excellent sell-through, and Canadian press coverage of TerraCycle was outstanding, including a 30-minute documentary featuring CEO Tom Szaky as a mock superhero named "Worm Boy." When the documentary aired, it surpassed even the most positive expectations, with more than 500,000 Canadians tuning in to hear the TerraCycle story. Based on these successes, TerraCycle's management team convinced both The Home Depot and Wal-Mart's Canadian branches to carry the TerraCycle product line, which included a two-liter refill of TerraCycle's flagship 20-oz product, as well as a "plant jelly" packaged in misprinted paint cans otherwise destined for a landfill.

Faced with nationwide distribution in Canada and ever-increasing small-store sales in the United States, TerraCycle's management team realized that the schools program was a logistical nightmare to implement across a large geographic area. Contacting and securing deals with schools across the United States and Canada would be time consuming, and it would have been virtually impossible to secure assemblies at the exponential rate of sales growth that inevitably results from a jump to big-box markets.

Having closed a \$1.2 million round of financing, TerraCycle was in the midst of a \$1.5 million series B round of financing. It had moved from a dingy office in Princeton, New Jersey, to a 10,000-square-foot factory in Trenton, New Jersey. Its management team had grown to more than ten, with roughly 20 additional laborers. Offices had been opened at Cornell University in Ithaca, New York, and in Toronto, Canada. TerraCycle's management team consisted of a group of seasoned executives who, fascinated with the idea of the company, agreed to work for a fraction of their market value; the top salary at TerraCycle by the end of 2005 remained \$30,000 (See Exhibit 1). TerraCycle was burning through more than \$50,000 per month, yet it had to continue to convince

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<sup>1</sup> TerraCycle. [http://www.terracycle.net/media\\_coverage.htm](http://www.terracycle.net/media_coverage.htm) (accessed March 6, 2009).

big-box distributors of its ability to brand and market its products, which were now set to be sold in thousands of stores across the United States and Canada (see Exhibit 2 for financial data).

By 2005, TerraCycle reached an interesting crossroads not at all unique to other small companies pursuing big-box distribution. Since its inception, TerraCycle has thrived on grassroots growth and support. Word-of-mouth sparked much of TerraCycle's initial sales, press, and investment. As TerraCycle grew, a crucial key to survival and growth as a company would be a successful go-to-market strategy. Did a big-box strategy make sense for a company of TerraCycle's size and positioning?

## The Products

When most people think of garbage, they probably think of smelly trash bags filled with everything from finished newspapers to yesterday's uneaten lunch. The overwhelming majority of waste in the United States does not come from our kitchens, however; rather, it is industrial waste, from chemicals to paper sludge to orange peels. In fact, total wastes in the United States exceed 50 trillion pounds per year (excluding wastewater).<sup>2</sup>

Essentially, garbage is something that someone wants to get rid of and is willing to pay to do so (otherwise we'd have trash overflowing from our houses and factories). TerraCycle is able to use some of this garbage—organic materials such as coffee grounds, beer hops, and orange peels—as inputs for its products. Because companies no longer need this garbage and are willing to pay tipping fees to get rid of it, TerraCycle is sometimes able to acquire its commodities (garbage) at a negative cost.

All TerraCycle products are made from, and packaged in, garbage that would have otherwise ended up in a landfill. To date, TerraCycle products are all derived from vermicompost (worm poop) and, as a result, are filled with thousands of living, beneficial microorganisms that stimulate plant growth. Packaging varies, from used 20-oz and two-liter soda bottles to misprinted one-gallon oil containers and misprinted paint cans (see TerraCycle Web site, <http://www.terracycle.net/index.htm>).

Farmers have used various types of compost as fertilizer for thousands of years. Gardeners consider worm poop the "black gold" of all fertilizers. Clearly, composting and, more specifically, vermicomposting are not novel concepts. A major focus of TerraCycle's research and development has been to develop the best blend of vermicompost and to do so in a way that is scalable. Beyond the product itself, TerraCycle's use of garbage as packaging has largely contributed to its successes to date.

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<sup>2</sup> Hawken, P.; Lovins, A.; Hunter, L. *Natural Capitalism: Creating the Next Industrial Revolution*. Back Bay Books: Boston, 2000; p. 52.

## The Market

The U.S. fertilizer market is part of the agricultural chemicals industry. To date, no nationwide lawn and garden manufacturers have made exclusively organic products, so while TerraCycle may seem an odd fit for this industry, the companies within this sector will be TerraCycle's major competition if it is to become a much larger company (see Exhibit 3 for an industry snapshot).

The industry, part of the basic materials sector, has a market capitalization of \$34 billion.<sup>3</sup> Scotts Miracle-Gro (SMG), with a market capitalization of \$3.23 billion, is the market leader within the consumer lawn and garden industry. Scotts enjoys somewhat of a monopoly on the United States lawn and garden market, with a greater than 50 percent market share in lawn fertilizers and growing media/plant food.<sup>4</sup> Scotts does not currently market or sell organic fertilizers.

Other major companies in the industry include Spectrum Brands (SPC), and privately owned subsidiaries of both Bayer CropScience AG and Dow AgroSciences LLC. Unlike Miracle-Gro, the fertilizer branch of SMG, Spectrum Brands has begun offering more environmentally conscious products and owns a variety of lawn and garden brands, including GardenSafe, Nu-Gro, Schultz, and Spectracide.

While there continue to be much smaller eco-friendly fertilizer companies as well as eco-friendly consumer products companies, they have yet to develop models that can be cost-competitive and scalable to compete with major players in their respective industries. EarthGro, owned by Allie's Wholesale LLC, makes more than 100 eco-friendly fertilizer products, but competes only in specialty hydroponics markets in the United States and Canada. Seventh Generation makes eco-friendly consumer products but charges more and, therefore, appeals only to a very specific portion of consumers who are willing to pay more for their eco-friendly and organic goods. TerraCycle's goal is to bridge the environmental and social benefits of brands like EarthGro and Seventh Generation with the efficiency and scale of Scotts and Spectrum. This goal is centered on TerraCycle's triple-bottom-line business model that allows the company to accomplish both goals simultaneously and as a result—not a consequence—of each other.

## The Interns

Since TerraCycle was founded at Princeton, it has continued to feed off the energy, enthusiasm, and creativity of college-age workers. In addition to Tom Szaky and Jon Beyer, TerraCycle has regularly employed college interns during the summer and throughout the school year.

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<sup>3</sup> Yahoo. <http://finance.yahoo.com> (accessed Dec 15, 2005).

<sup>4</sup> Corporate Watch. <http://www.corporatewatch.org/?lid=367> (accessed Nov 25, 2005).

The summer intern program began in 2003 with Szaky and Beyer convincing a group of friends from Princeton to work free of charge, to sleep on the floor of TerraCycle's small Princeton office, and to help build what was then nothing more than an idea. During the following school year, Szaky convinced his friend, Alex Salzman, to take a leave of absence from Princeton with him, while co-founder Jon Beyer chose to continue his studies.

After realizing the success of the 2003 program, Tom Szaky was determined to expand the intern program. To make the summer more attractive, Szaky purchased a large house in Trenton, New Jersey, and offered free room and board as well as equity to those who were selected to work with TerraCycle for a summer. In 2004, the intern program expanded to 25 college students from many schools, including Princeton, Cornell, and Villanova. During the summer, Alex Salzman started a new branch of TerraCycle—TerraCycle lawns. That fall, Steve Kurz (author of the case), a Cornell sophomore, opened a sales office in Ithaca, New York, to build the company's hydroponics branch, which he started during the summer. Over the next year, these new branches saw some successes, but ultimately Kurz and Salzman chose to spend their time focusing on TerraCycle's primary goal—gaining big-box distribution for its products. Since 2004, TerraCycle's Cornell branch has employed eight Cornell students as interns, who contribute to TerraCycle while continuing their undergraduate education and taking regular course loads.

As TerraCycle's intern program has grown, so too has the publicity surrounding it; TerraCycle recently garnered interest from television networks in the United States and Canada, which are considering a reality television show around dozens of college students living together and building a company.

## **Why Hasn't This Been Done Before?**

Composting in many forms—vermicompost included—is not in itself a revolutionary idea. Manufacturing vermicompost-based products consistently on a large scale, however, is quite difficult. For instance, how do you separate the worms from their poop? How can the process be expedited? How do you ensure a steady stream of the proper organic waste? What is the best way to use the actual product once it's created?

Vermicompost products work in large part because of thousands of living, beneficial microorganisms that stimulate plant growth. Prior to TerraCycle, many manufacturers of vermicompost infused their compost teas with oxygen to speed up the process. This infusion of oxygen often killed many of these organisms and severely shortened the products' shelf lives. TerraCycle, on the other hand, uses an anaerobic brewing process that extends the shelf life of its products to more than one year.

Typically, "green" companies are forced to market and sell products that are either sold at higher price points or are of lower quality, or both. These companies are focused on the relatively small percentage of the population that is willing to accept these noncompetitive features because of some personal benefit or fulfillment they receive

from purchasing products that they perceive to be better for the environment. Seventh Generation, a leading environmentally responsible consumer products company, openly admits that its products are of inferior quality and are geared towards eco-conscious consumers willing to pay more for its products.

These realizations bring up two important questions. Why aren't there more organic fertilizers on the market; and what does this mean for TerraCycle? Serious barriers to entry—from the stringent state-by-state fertilizer regulations in the United States, to the dominance of Miracle-Gro, to an enduring stigma associated with organic products (which have yet to gain mass appeal)—have been a major reason why organic fertilizers have not had tremendous successes on big-box shelves prior to TerraCycle. To thoroughly examine these factors would be impractical for the purposes of this case, but the question remains: if organic fertilizers can be proven to outperform chemical counterparts, what has prevented them from making it to big-box shelves, and why has TerraCycle been able to break through these barriers (so far)?

TerraCycle's solution is quite simple and is the core of its success as a triple-bottom-line company: the goal is to sell better fertilizers at a cheaper price. Making a fertilizer entirely out of garbage (thereby making it organic and eco-friendly) is the most cost-effective way to do so. Moreover, TerraCycle has been able to leverage the ingenuity of this model and its grassroots support to gain tremendous press coverage, which in turn has encouraged sales and investment, essential to any growing company.

## **Die-Hard Capitalists or Environmental Saviors?**

Since Tom Szaky founded TerraCycle, the company has been focused on establishing relationships with the four big-box outlets that represent roughly 80 percent of the lawn and garden industry in the United States: Wal-Mart, The Home Depot, Lowe's, and Kmart. While many consider Szaky and the company to be environmental heroes, Szaky insists he is first and foremost a capitalist; in numerous articles, Szaky is quoted discussing the "greed hat" he has used to build the company and deliver returns to his shareholders.<sup>5</sup> Interestingly, in the case of TerraCycle, by using his greed hat to realize the highest margins and pursue the largest sales outlets, the company is able to do good simultaneously by reusing bottles and by spreading the word about the way in which it does business.

As the company has grown, many followers of TerraCycle have questioned the company's big-box, go-to-market strategy. Szaky often poses this question: if you go to a store and see a bar of organic soap for \$1.50 that is of equal quality to a non-organic bar of soap for \$1.00, which will you buy? All other things equal, the majority of people will choose the \$1.00 bar of soap. But what if an organic alternative of equal or better quality could be offered for a *lower* price and not only at specialty stores? What would happen if Wal-Mart began carrying organic products and people were buying them?

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<sup>5</sup> CNN.com, AP®, 2005. Turning worm excrement into profit. [http://terracycle.net/media/05-12-11\\_cnn/05-12-11\\_cnn.htm](http://terracycle.net/media/05-12-11_cnn/05-12-11_cnn.htm) (accessed March 10, 2009).

As of January 1, 2006, TerraCycle had one manufacturing facility of roughly 10,000 square feet. Much of the worm-farming process was outsourced to three facilities (in North Carolina, Alabama, and Washington State) to meet existing demand for its products. To preserve the living, beneficial microorganisms so crucial to the efficacy of TerraCycle's products, every batch of solid worm poop must be brewed for days before being bottled. With any major big-box partnership, TerraCycle would be responsible for supplying thousands of stores across North America with its products, which would require a significant jump in production and greatly expanded access to used soda bottles.

In spring 2006, TerraCycle won contracts to supply Wal-Mart, The Home Depot, and CVS stores *throughout all of North America*. Does committing to the big-box strategy make sense for TerraCycle, given its history of grassroots support and word-of-mouth marketing? Will it be able to scale production to meet dramatically increased demand? How can the company source bottles and other garbage needed for the product? If it is successful, how does TerraCycle protect itself from competitive response? Does it have a source of sustainable competitive advantage? What about expansion outside of North America or internal commercial (agricultural) markets?



# Exhibit 1

## The Team: Key Principals

**Tom Szaky**, CEO—On an indefinite leave from Princeton University, Szaky has won a number of national community service awards in Canada and started four successful companies prior to TerraCycle.

**Betsy Cotton**, CFO—Before becoming TerraCycle's CFO, Cotton was the CFO for Stratum Group, L.P., which finances oil and gas companies. Previous employers include MG Trade Finance Corp. and Philipp Brothers and Bankers Trust Company.

**Jon Beyer**, CTO—Beyer co-founded TerraCycle with Szaky. In 2005, he received a degree in computer science from Princeton University, where he participated in numerous research and freelance software engineering projects.

**Richard F. Ober, Jr.**, VP, general counsel, and secretary—Ober headed the 25-attorney legal department at Summit. During his tenure, Summit grew from \$2 billion to \$39 billion, completing 27 acquisitions and \$5.5 billion of securities offerings.

**Tom Pyle**, chairman—Pyle is an expert in international banking, finance, and development. He has held executive positions at JPMorgan Chase, Deutsche Bank, and Skandinaviska Enskilda Banken.

**Brian Tuffin**, board member—Prior to his position as COO at Onyx Capital Ventures, LLC, Tuffin was the president of SC Johnson and Son Ltd. Canada.

**Royce Flippin**, board member—Flippin is the former director of program advancement for the Massachusetts Institute of Technology. He also has worked with Exxon and General Foods Corporation, as well as with smaller mutual funds and consulting firms.

**Eric Smith**, VP, sales—Smith joined TerraCycle with significant domestic and international sales experience, including director of global category management at SC Johnson. He also has worked with Procter & Gamble and Phillips Lighting.

**William Gillum, Ph.D.**, VP, research and operations—Gillum earned a Ph.D. in inorganic chemistry from MIT, a B.S. from Washington State University, and an M.S. from Indiana University. He was a postdoctoral scholar at Stanford University. Gillum has more than 20 years of experience in process design research and development, and worked on the technical staff at Bell Laboratories.

**Joe Willis, Ph.D.**, director of plant research—Willis earned a B.S. in botany from North Carolina State University and a Ph.D. from the University of California, Riverside. Willis has more than 20 years of experience in plant research and crop production, including work and studies in microbiology, plant pathology, plant physiology, molecular biology, genetics, bioengineering, and controlled environmental agriculture.

**Robin Tator**, VP, marketing—Tator has more than 20 years of experience with big-box marketing and launched New World Marketing, taking it from \$200,000 in sales to \$35 million.

**Rick Kraemer**, VP, logistics—Kraemer has more than 13 years of experience with consulting and channel management for a logistics and mapping software company.

**Barry Brinster**, VP, communications—With more than 30 years of experience in advertising, public relations, and consumer marketing, Brinster has developed and executed marketing plans for Kimberly Clark, Rubbermaid, Pizza Hut, and PepsiCo.

**Elaine Gaughran**, VP, human resources—Gaughran has more than 30 years of experience in all aspects of human resources management; she previously worked for Bell Laboratories, AT&T, and Summit Bank.

## Exhibit 2

### TerraCycle Financial Data<sup>6</sup>

<b>Table I: TerraCycle Key Indicators</b>				
	<b>Actual:</b>		<b>Projected:</b>	
	2004	2005	2006	2007
Gross Sales Revenue (thousands of USD)	\$165	\$445	\$1,500	\$6,000
Number of Full-Time Employees	13	20	50	150
Number of Summer Interns	30	30	40	50
Locations	2	3	5	8

<b>Table II: TerraCycle Balance Sheet (US \$000s)</b>		
	12/31/2004	3/31/2005
<b>ASSETS</b>		
Cash and Equivalents	70	52
Accounts Receivable (Net)	12	197
Loans	9	7
Inventory	82	212
Total Prepaid Expenses	56	64
<b>Total Current Assets/Other</b>	<b>229</b>	<b>532</b>
Fixed Assets	175	111
<b>Total Assets</b>	<b>404</b>	<b>643</b>
<b>LIABILITIES AND EQUITY</b>		
Accounts Payable	43	70
Loan	3	150
Other	25	26
<b>Total Current Liabilities</b>	<b>71</b>	<b>246</b>
Total Stock	1,309	1,584
Retained Earnings	-976	-1,187
<b>Total Equity</b>	<b>333</b>	<b>397</b>
<b>Total Liabilities and Equity</b>	<b>404</b>	<b>643</b>

<b>Table III: TerraCycle Income Statement (US \$000's)</b>	
	<b>Q1 2005</b>
<b>INCOME</b>	
Net Sales	178
COGS	101
<b>Gross Profit</b>	<b>71</b>
<b>EXPENSES</b>	
Total SGA	113
General Office	21
General Overhead	23
Interest	2
Plant Overhead & Expenses	22
Other	9
<b>Total Expenses</b>	<b>190</b>
<b>NET PROFIT/LOSS</b>	<b>-113</b>

<sup>6</sup> Private companies are under no obligation to disclose financial data. Ideally, this case would include balance sheet and income statements from the past three years, as well as forward-looking projections for the following five years. Currently, this data cannot be incorporated into the case, but it may be included in future editions. The financial data included, while incomplete, is meant to give the reader perspective on TerraCycle's current size and financial status.

## Exhibit 3 Industry Snapshot

	<u>SMG</u>	Pvt1	Pvt2	<u>SPC</u>	<u>Industry</u>
Market Cap:	3.23B	N/A	N/A	1.03B	1.02B
Employees:	5,291	19,000 <sup>1</sup>	5,500 <sup>1</sup>	9,800	4.62K
Qtrly Rev Growth (yoy):	-1.20%	N/A	N/A	60.20%	13.00%
Revenue (ttm):	2.37B	8.11B <sup>1</sup>	3.37B <sup>1</sup>	2.36B	2.37B
Gross Margin (ttm):	36.30%	N/A	N/A	39.50%	31.47%
EBITDA (ttm):	298.80M	N/A	N/A	329.23M	298.80M
Oper Margins (ttm):	9.78%	N/A	N/A	11.37%	9.79%
Net Income (ttm):	100.40M	N/A	N/A	46.83M	76.87M
EPS (ttm):	1.466	N/A	N/A	1.026	1.07
P/E (ttm):	32.43	N/A	N/A	19.73	18.89
PEG (5 yr expected):	1.35	N/A	N/A	0.60	1.39
P/S (ttm):	1.36	N/A	N/A	0.43	0.89

**Pvt1** = [Bayer CropScience AG](#) (subsidiary or division)

**Pvt2** = [Dow AgroSciences LLC](#) (subsidiary or division)

**SPC** = Spectrum Brands, Inc.

**Industry** = Agricultural Chemicals

<sup>1</sup> = As of 2004