

CalRecycle/CIWMB Waste Reduction Awards Program (WRAP)

Case Studies

The following case studies reveal some of the waste prevention methods of businesses that have received awards from the Waste Reduction Awards Program (WRAP).

- >> [Anderson Valley Brewing Company](#)
- >> [Greenfeet](#)
- >> [Owens Pharmacy #6](#)
- >> [Smucker Quality Beverages, Inc.](#)
- >> [Thanksgiving Coffee Company](#)

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Waste Reduction Awards Program (WRAP)

Anderson Valley Brewing Company

WRAP Award Winner: 2005, 2004, 2003, 2001, and 2000

Introduction

Anderson Valley Brewing Company (AVBC), located in Boonville, Mendocino County, was founded by Kenneth and Kimberly Allen in 1987. The Allens started making and selling beer at the local Buckhorn Saloon. In 1996, they moved to the brewery's current 30-acre site, about a mile away. AVBC currently makes about 20,000 barrels a year (a total of about 620,000 gallons).

The AVBC facility includes a 7,500-square-foot brew house where the grains are stored and mashed (see below) and a 16,000-square-foot building that houses their cellar, office, and packaging operation. The facility also includes a 3,000-square-foot visitor center with a tasting room and gift store, and a 3,000-square-foot horse stable.

The brewery has 36 employees, 6 of whom work in brewing; the other 30 work in packaging, administration, engineering, and the visitor center. Eight employees commute from Ukiah, about 25 miles one way; the rest live in the Anderson Valley, commuting less than 10 miles one way.

AVBC has applied for and received multiple awards from the Waste Reduction Awards Program (WRAP), the most recent in 2005. In February 2006, Board staff interviewed brewer Neil Atkins and other brewery staff. Atkins, who is also responsible for quality assurance/quality control, worked at the brewery from 2002 to 2005. He left to work at a New Orleans brewery, but returned to AVBC after Hurricane Katrina.

Operation Basics

AVBC buys about 94 percent of its malted barley from Canada; about 5 percent comes from Wisconsin and about 1 percent from Great Britain. Their supply of hops comes from the state of Washington and their water is supplied by on-site wells.

In the brew house, the malted barley is "mashed." This process involves crushing the grain, adding hot water to the mixture, and steeping it in copper vats for about 90 minutes; mashing changes the starch into fermentable sugars. The spent grains are separated and pumped out of one side of the building to a driveway area, where two ranchers back up their trucks to collect the grain; see Organic Waste below.

The remaining liquid, called the "wort," is pumped into a stainless steel boil kettle. Hops are added along with gypsum, which helps break down the proteins. The wort is boiled for another 90 minutes and then goes to a whirlpool to remove the hops and some of the protein. The spent hops go to one of the ranchers, see below.

After the whirlpool, the wort is cooled from over 200 degrees Fahrenheit to about 70 degrees on its way to a stainless steel fermenting tank in the adjacent building. Yeast is added from cultures that are stored at another facility. The wort ferments for about five days, is aged for two weeks, and becomes beer. The beer is filtered to remove remaining yeast, hops, and proteins; at this point it is called "bright beer," the term used for beer that has been cleaned of yeast. Most of the yeast is reused; some goes to a local farmer as described below.

The bright beer goes into a tank where carbon dioxide is added; the beer is then bottled or kegged. The [brewing process](#) is described on the AVBC website.

[To Top](#)

Waste Reduction/Reuse

Beer

Practicing waste reduction is cost-effective, explained Atkins. According to General Manager Graydon Brown, AVBC had recently reduced its loss of beer by 85 percent by replacing and repairing equipment and adjusting the flow meter, which regulates the amount of beer going into keg machines.

About 40 percent of AVBC's beer production goes out in reusable 5-, 13.5-, and 15.5-gallon kegs. The brewery uses its own kegs for in-state shipping as they are able to ensure that the kegs are returned, explained Atkins. For out-of-state shipping, AVBC leases kegs from a private company; these are sent out with AVBC's beer and then will be cleaned and used by successive breweries.

Cardboard, Bottles, and Paper

Bottles are shipped to the company in cardboard cases. The 12-ounce bottles are shipped 24 bottles to a case, and the 22-ounce bottles are shipped 12 to a case. The empty 12-ounce bottles are already in their six-pack carriers. The bottles are taken out of the cases, rinsed, sanitized, filled, labeled, and put back into the same cardboard boxes that are date-stamped and shipped out.

If there are bottles left over when they are making a particular kind of beer, these will be rinsed-sanitized again to be filled with the

next batch, explained Atkins.

AVBC office manager Sandra Liebig noted that the company reuses paper in the office by cutting it up to use as note pads.

Chemicals

The brewery uses peracetic acid and a caustic alkali, mixed with water, for cleaning the tanks after each batch of beer is made. By checking to see that the pH levels remain suitable for the cleaning, Atkins explained, the brewery is able to use the cleaning solution multiple times, which reduces waste. When the cleaning mixture can no longer be used, it is pumped into the first pond of the site's water treatment system (see "[Water Treatment](#)" section below).

The acid and alkali are shipped to AVBC from Oakland in 55-gallon plastic barrels at a rate of one barrel every three months. The barrels get reused in a variety of ways, explained Atkins. Inside the plant, they are filled with water and iodine so the off-flow tubes from the various tanks can be vented into them. This creates a sanitary seal that assures no air can get into the tank. The spent hops are put into the buckets and then hauled by the farmers (see "[Organic Waste](#)" section below). The barrels are also used as trash cans indoors and outdoors. One of the brewery's workers has made baskets for the game of disc golf from the barrels. Any barrels that are not reused are recycled.

Pallets

Because the empty bottles cannot be stacked as densely as full ones, AVBC has more wooden pallets shipped to them than they ship out. The empty bottle cases are shipped in at 60 to a pallet, and the full bottle cases are shipped out at 72 to a pallet. For every 48-pallet truckload of empty cases that comes in (at a rate of about 1.5 truckloads per week), 40 pallets of beer are shipped out, leaving 8 empty wood pallets at the brewery. So there is quite a collection of used pallets, notes Atkins. "We have had companies come up from Santa Rosa, Petaluma, and Windsor and say they will take the pallets at a charge of \$1 per pallet. But we want to sell them. Used pallets are worth \$5-\$7; new ones are \$15-\$20. So we are still working on an environmentally friendly solution that is cost-effective."

Other Reuse

AVBC also has a "bone yard" where they put used plastic and metal pipes, equipment, and other discards for reuse. "We don't throw much out," notes Atkins. Used brewing equipment is also listed for sale on the company's website.

Organic Waste

Brew By-Products

As noted under [Operations Basics](#) above, there are three by-products from making beer: spent grain, hops, and yeast.

As is traditionally done by breweries, the spent grain is used for animal feed. AVBC sells the spent grain to two ranchers. One is a Petaluma goat rancher, who picks it up two days a week. The other is a local cattle rancher, Peter Bradford, who gets it three days a week. Bradford raises beef cattle on a ranch down the road from the brewery. According to AVBC's WRAP application, the farmers paid a total of approximately \$6,000 for this grain in 2004.

The spent grain is fed directly to the cattle and makes very good inexpensive feed, Bradford explains, because it has high total absorbable nutrition and very little waste. Bradford gets about 6.8 tons per day from two batches of beer (6,800 pounds per batch) and he would take more if he could.

The spent hops are loaded from the whirlpool and hop back (the sealed container used to hold the hops) inside the brewery into the used 55-gallon barrels. Some beers are made with hop pellets rather than hops, so they do not produce a by-product. Batches that use non-pelletized hops produce about two barrels per batch, which also go to Bradford. The availability of the hops depends on the brewing scheduled, but on average Bradford picks up the spent hops about twice a week. He uses these for mulching around buildings and in the gardens. Bradford noted that the hop mulch improves soil moisture by cooling the ground and keeps unwanted plants from growing.



Yeast, which settles to the bottom of the fermentation tank, is pulled off into previously used bright beer tanks. About 170 gallons of yeast are extracted for each 3,100 gallons of beer (100 barrels at 31 gallons a barrel). AVBC reuses most of the yeast in successive beer batches. About two percent is sold to John Volker, a local organic farmer, who sprays it on his crops. Volker's Boont Organic Farms supplies produce to the Boont Store located on the main street in Boonville.

Compost

Since 2003, the brewery has had four shire horses that have been used to offer carriage rides and beer delivery (this service has been temporarily suspended, according to AVBC's website). AVBC buys a 90 percent inert shaving mixture from Canada for its horse stalls. Cleaning the horse stalls produces an annual total of about two tons of a sawdust, manure, and urine mixture that is composted and sold to the public for \$20 per pickup truck load.

Atkins noted that he had previously grown oyster mushrooms in the compost in a trailer on the property and offered them free to employees. He hopes to start production again and sell them at the local mushroom festival and farmers market.

Recycling

"We have increasingly emphasized recycling because our customers want it," explained Atkins. "We try to recycle everything we can." The brewery recycles plastic shrink/stretch wrap, paper, steel, glass, and plastic bottles (polyethylene terephthalate [PET] and high-density polyethylene [HDPE]). They also recycle cardboard from a variety of sources including damaged boxes, the top sheets used to protect the empty bottles in shipping, and other boxes that contained goods shipped to them.

In 1998, AVBC bought a baler, enabling them to compact their cardboard and shrink/stretch wrap. Summertime Farms of Berkeley picks up these baled items along with boxes of used glass bottles, explains James Crabtree, who coordinates the brewery's shipping, receiving, and recycling.

Willits Solid Waste supplies the company with six 90-gallon plastic containers, three for PET/HDPE and three for mixed paper. According to the 2005 WRAP applications, AVBC recycled more than 20 tons of glass, 10 tons of cardboard, and 4 tons of plastic wrap between June 2004 and June 2005.

AVBC, like other businesses, does end up with broken pallets, which they sell to the public for firewood along with branches that have fallen from the oak trees on the property. If truckers are careful, Atkins explains, they can maintain a low breakage rate on the pallets.

Willits also collects a 2-cubic-yard dumpster once a week that is hauled to the landfill. According to the WRAP application, this is about 200 pounds a week or 5.2 tons per year. Some of the trash comes from the employee lunch room, Atkins noted, but AVBC has not done a waste assessment of what else is being landfilled.

[To Top](#)

Environmentally Preferable Purchasing

AVBC's 85- and 100-barrel copper brew kettles came from two closed breweries in Germany, Ambrose Brutting Braü (Stoffelstein) and Magnus Braü (Kassendorf), explained Atkins. They have also purchased previously used stainless steel tanks.

The bottle glass, which comes from Owens-Brockway in Portland, has 50 percent postconsumer and 65 percent overall recycled content, explained AVBC's Peter Suddeth.

While the company only buys wood pallets, they do use plastic pallets which are brought by some of the truckers and re-circulated as AVBC loads their goods. Plastic pallets have a higher cost, but also last longer than wood ones.

AVBC has a non-toxic pest control system, an affable feline named Crystal, to remove rodents from the horse stables.

Energy

Transportation

The company uses energy to transport all of the beer ingredients, except the water, to the brewery and to ship out the finished beer. About 80 percent of their beer is sold in California, Atkins notes, and the rest is sold in about 15 other states. AVBC hires a Ukiah trucking company to deliver their beer; when the trucks return, they bring back other goods so that they are not running empty miles. AVBC's other vehicles include a diesel van, two electric forklifts, an electric snorkel lift, one propane lift; and a diesel tractor.

Operations

Both the brew house and the building used for the cellar, office, and packaging operation, are insulated to conserve energy. Because of the insulation, the cellar stays at the 65°-68°F temperature required for the yeast without heating or cooling. The wort and bright beer are cooled using glycol through electricity-driven pumps.

The brewery operates five days a week, 12 hours a day. Energy conservation is encouraged by signs reminding workers to turn off the lights and water and shut the doors.



In February 2006, the brewery's \$860,000 solar power project became operational. According to AVBC's website, the system includes 768 photovoltaic panels which cover about 12,160 square feet and should last 40-50 years. The panels are located on the south facing roofs of the cellar/office/packaging building and on a free-standing open-sided structure which is also used for parking. The panels provide about 40 percent of their energy needs, notes Atkins. Of AVBC's approximately 30 acres of grass, about 2.5 acres are mowed using a team of eight goats. The rest is mowed mostly with the tractor; some is eaten by the horses.

Water Treatment

The brewery has a three-pond water treatment system that covers about 1.5 acres. Water from the tank-cleaning goes through

this pond system to balance the pH level. Toilet and washroom water goes into a septic system.

In the first pond, the water is treated with bacteria that consume excess nutrients, by-products of the brewing process, Atkins explained. In the second pond, the water is aerated, and in the third pond it is clarified. Mosquito fish and gold fish are used in the third pond to keep down mosquitoes. From the third pond, the water is drip-irrigated on 15 acres of the site's grass.

What's Next

The brewery is considering obtaining a license to make ethanol from distilled beer waste, explained general manager Brown. The distiller would be run using steam recovered from the beer making process. The ethanol produced would be mostly used as a sanitizer inside the brewery. This could become a reality in the next year or two.

AVBC is also looking at the possibility of recapturing the carbon dioxide produced in fermentation, to carbonate the beer before bottling or kegging. This would reduce or eliminate the need to buy carbon dioxide. The setup for this process is costly, Atkins notes, but buying carbon dioxide is also expensive. A system could pay for itself after five years.

The brewery is also looking at bottle conditioning as another method of reducing the need to purchase carbon dioxide is bottle conditioning. In this method, a little yeast is added to beer in the bottle before it is capped; the carbon dioxide is then produced in the bottle.

As of mid-2006, AVBC was constructing a fountain using a recycled brewing vessel at the brewery entrance.

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[To Top](#)

[WRAP Case Studies](#) | [WRAP](#)

Waste Reduction Awards Program (WRAP)

Greenfeet

WRAP Award Winner: 2005 and 2004

The Green Mission

Encouraging the general public to practice environmentally preferable purchasing is the aim of [Greenfeet](#). A 2004 and 2005 Waste Reduction Awards Program (WRAP) winner, Greenfeet sells more than 2,500 "eco-friendly" products online and in its 2,200-square-foot [retail store](#) located in Chico.

The products that Greenfeet sells are intended to "leave smaller, 'greener' footprints" on the environment, according to the company's website. Included are household products such as sheets and towels made from organic cotton, hemp clothing, knapsacks, long lasting cookware, reusable coffee filters, toothbrushes, razors, and plastic bags made from recycled plastic. Natural scents and soaps are sold along with non-toxic cleaning products and drying racks made from reused wood. Also available are frames, letter holders, and other items made from a variety of reused materials such as bike parts, glass, and old records. The Consumer Packaging Reduction (CPR) kit includes a reusable nylon shopping bag that folds up into a small pocket, a stainless steel water bottle, and a coffee cup.

Greenfeet is the brainchild of Valerie Reddemann, who started it as an online business in 1997. Reddemann was interviewed by Board staff in February 2006 at her Chico store.

"Our goal is introducing green products to the everyday person in a friendly, accessible atmosphere," explains Reddemann, standing inside the natural-light-filled, tidy Chico store. "We wanted to have a nice store with cool, hip, environmentally friendly, everyday products that anyone can use. We know our customers by name; we see them in the community. The store is all about customer service. A lot of new customers come to us through word-of-mouth."



Reddemann started the business in Los Angeles, where she moved after graduating with a marketing degree from California State University, Sacramento. "I was working very hard selling corrugated boxes and retail displays and got burned out," she explained. "I learned about essential oils, started using them myself, and then went to work for a company that produced and distributed them."

Not long after, she started her own business selling essential oils at home parties. That business grew and she began to add other products consistent with a greener lifestyle. The business went from home party sales to online sales. Reddemann and her husband, Robert Reddemann, who helps with the business, eventually decided to move out of Los Angeles.

"We wanted to be where we could bike to work and where everything wasn't so far away," Reddemann explains. "We also wanted to be closer to family and in a healthier environment." They picked Chico, which has an urban area population of about 102,000, and in 2002, opened the Greenfeet store. Today they have five full time employees, two part time employees, and rotating interns.

Product quality is essential and price is a consideration in the business, notes Reddemann. "Products must pass our quality inspection. We do our best to keep prices down because we're consumers too. However, quality items will last longer, so customers save over the long run. It's a mindset."

Reddemann's message goes beyond individual pocketbooks to environmental costs. "The key is to identify what's important to the customer and how to talk to them," says Reddemann, who said she used to shop without thinking about where products came from, who made them, or what they were made of, because she "just wanted to get the cheapest thing." Reddemann's philosophy is different now. She says, "We educate that it's important to look at all costs, including both environmental and social impacts that a product has during its creation."

Reddemann acknowledges that she has a huge passion for the company's mission, and that she has to be careful not to get on a soapbox. "People have to want to be green," she explains. "You can't force it. More than a store, this is a place where people can learn and be inspired. Once people understand the environmental connections, they want to do things. It's about taking baby steps, starting to make better choices."

"There's an exercise I do when talking to large groups. I ask someone to stand up and take ten steps while another person times them. Then I'll ask 100 people in the audience to stand up and take one step, which is also timed. What you see is that the small efforts of lots of people can make a bigger impact than the larger effort of one person."

Reddemann also expresses that people making the little steps need to be applauded. "We hope to get more people in the same mindset. Some people will stop, some people will keep going. We want to get the message out there that being green is possible."

[To Top](#)

A Practice of Reuse, Reduce, and Recycle

Store



The Greenfeet store opened in an existing building in a small shopping center near downtown Chico. Reused shelving was utilized for some of the display racks. The offices have used cabinets, file cabinets, and chairs. In the stock room, they attached reused cardboard to the ends of the open stocking shelves to prevent items from falling.

Noting the building had no bike racks, Reddemann was able to finally convince her landlord to install some. "Both customers and employees use them nearly every day," she said, contributing to a reduction in air pollution and energy use.

Shipping

Since 80 percent of Greenfeet's sales are online, the company does a lot of shipping. Order verifications are sent via e-mail rather than on paper, Reddemann explains. For packing, Greenfeet reuses as much cardboard, peanuts, and bubble wrap as possible, and supplements with shredded ledger paper. The company even stamps packages with a "Blatantly Reused Packaging" stamp as a way of educating people about reuse.

Greenfeet has asked other businesses for their used packing material. A local bank gives Greenfeet packaging peanuts for reuse, and neighboring businesses bring in used cardboard boxes.

Customers also bring in boxes and packing material, something Reddemann encourages to get people thinking about reuse, even if Greenfeet can't always use them. Once a vendor shipped items to Greenfeet that were packed with used plastic bags. The bags did not look good and did not seem clean, so they could not be reused for packing.

As indicated in the WRAP application, Greenfeet also promotes customer reuse of packing materials. A tip sheet with reuse ideas is included as part of customer invoices on shipped items.

Some of the companies Greenfeet buys from will ship directly to customers, which helps reduce the packing material and the space needed for handling products. About half of the store's current space is devoted to the stock room, shipping area, and offices.

Towards a Minimal-Paper Office

"I made a commitment early on that we would not print a paper catalog," explains Reddemann, "even though people do ask for one." Greenfeet's paperless company newsletter is e-mailed to about 26,000 subscribers. Another paperless form of communication and advertising is their [weekly podcast](#) available over the Internet.

Other efforts at minimizing paper waste include the following:

- >> Within the office, Greenfeet seeks to minimize paper use through its shared computer system that allows employees to get information and share messages from any computer in the store. Employees also use erasable message boards, notepads made from used paper, the company intranet, and e-mail, as well as their voicemail system.
- >> Greenfeet also has a magazine swap where employees and customers can share magazines. Outdated magazines are donated to local day care facilities for use as craft projects, or they go into the mixed paper bin for recycling.
- >> Whenever possible, customers and employees are encouraged to avoid bagging products, to use reusable shopping bags, or to reuse disposable bags. Cashiers are trained to not offer bags to customers unless the need for one is obvious.
- >> Greenfeet also tries to eliminate or minimize nonpaper waste streams. For example, as reported in its 2005 WRAP application, Greenfeet provides employees with reusable cups and silverware to use in the office.

Recycling

Greenfeet recycles material that they cannot reuse, including damaged cardboard or boxes that are made of cardboard that is too weak to withstand a second shipping, mixed office papers, plastics, glass, and aluminum.

When the store opened, there was no collection of recyclables for the site. Reddemann contacted the local waste company and ask them for recycling bins. The waste company now collects recycled materials on a weekly basis from a 2-yard cardboard dumpster, a 96-gallon container for white office paper, and two 64-gallon recycling cans. In 2004–05, Greenfeet sent approximately 1.8 tons of material to be recycled.

Greenfeet has a 96-gallon garbage can that is emptied weekly by the waste company; it is rarely more than half full. Disposed of items include film plastics, other plastics deemed unrecyclable, and used paper towels (Greenfeet is working to find out about composting these).

As a result of its waste reduction and recycling efforts, in 2004-05, Greenfeet saved an estimated \$423 in waste disposal costs.

[To Top](#)

Environmentally Preferred Purchasing

In addition to selling environmentally preferable products, Greenfeet also seeks to buy such products for its own use. Its office supplies come mostly from the Office Depot Big Green Book, explains Reddemann. The company uses office paper with 35 percent postconsumer recycled content. Business cards, brochures, stationary paper, and packaging materials are at least 25 percent postconsumer. Toilet paper and paper towels are 100 percent recycled, 40–60 percent postconsumer.

Greenfeet purchases good-quality computers and electronics, notes Reddemann. "We would rather repair equipment than dispose of it. Our focus is on functionality; we aren't big on the newest, latest, and greatest. Computers that can be upgraded are preferable. When it's time to upgrade to new equipment, we offer older items first to school donation programs or local charities before recycling."

When the business moved into its Chico location, Reddemann emphasized green methods in the renovations. No or low-volatile organic compound emission paints were used for the walls. To reduce off-gassing, solid wood flooring was used rather than particle board. For some of the wood shelving, Reddemann used pine that was certified as being sustainably produced by the Forest Stewardship Council and was milled in nearby Chester. The track lighting in the store uses compact fluorescent lights.

Fostering Sustainability

Finding Products

"It can be challenging to find companies that offer goods that fit our guidelines," says Reddemann. "We go to several trade shows and hope to identify a few new vendors with products we can sell."

Part of the challenge is finding reliable vendors. Greenfeet often works with small companies that face production challenges. One example was a local vendor who made bird houses out of recycled materials. "The bird houses were great, but we could not get them consistently," Reddemann says.

Greenfeet tries to use as many West Coast vendors as possible, notes Reddemann. This saves fuel and energy and cuts down on the shipping costs, which are higher if suppliers are located farther away.

Reddemann has made vendor contacts through Co-Op America's annual [Green Business Conference](#) and the Green Economy Expo, which is part of the annual [Green Festival](#) sponsored by Global Exchange and Co-Op America.

Obtaining textiles from the United States is difficult because most mills have moved out of the country, Reddemann noted. Unfortunately, Greenfeet has had production problems with one of the remaining mills. Also, hemp, a very durable fiber that can be grown without pesticides and with much less water than cotton, cannot currently be grown legally in the United States.

Some of Greenfeet's products may support a sustainable lifestyle but may not necessarily be sustainable themselves, explained Reddemann. An example is the CPR kit nylon shopping bag, mentioned above, which is made in China from petroleum derivatives. "One reusable bag can save over 1,000 plastic bags from the landfill based on its life expectancy," she noted.

Reddemann is working on putting Greenfeet's product standards in writing for vendors. This would include specifying the origin of products and their components, environmental concerns, labor rights, fair trade certification, and other issues. Distributors and manufacturers would then be asked to provide information about how their products addressed the standards.

Reddemann, a member of Co-op America's Fair Trade Alliance, also wants to work with companies to help them meet the standards. "If Co-op America finds a company making a good product but not using fair trade, they will encourage and offer to work with them to make a change. We want to do that also."

Promoting a Sustainable Community

Promoting a green community and green business in Chico is important to Reddemann. She writes for Insideout, a local magazine, and has been interviewed on local radio and television. Reddemann is currently working with other local green-oriented businesses to create a green business directory.

Reddemann supports the [Slow Food Movement](#), which encourages people to be more mindful of what they eat, have more civilized meals, and minimize "fast food" meals. "It's about being conscious of even the most ordinary choices, such as what we're going to have for breakfast," she says.

Greenfeet has held classes on organic gardening, gardening with native plants, skin care, aromatherapy, and other topics.

What's Next

Expanding the Greenfeet store is one of Reddemann's goals. This would allow for a more diverse inventory including green building products such as paints with no or low volatile organic compounds, renewable floor coverings, recycled counter tops, and other materials. Reddemann would also like to add more quality, multipurpose appliances and carry more nonplastic housewares such as glass, ceramic, and stainless steel to help people deplasticize their homes.

Reddemann has also considered looking at a more retail-oriented location, ideally in a free-standing building. She would also like to be able to keep both the retail store and the Internet order business in the same location.

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[To Top](#)

[WRAP Case Studies](#) | [WRAP](#)

Waste Reduction Awards Program (WRAP)

Owens Pharmacy #6

WRAP Award Winner: 2005

Introduction

A family owned-company, [Owens Healthcare](#) opened its first pharmacy in 1957 in Redding. Today the company has eight locations that provide regional pharmacy and other medical services.

In February 2006, Board staff interviewed Christopher Dold, who started reuse, recycling, and environmentally preferable product purchasing at Owens Pharmacy #6, a long-term-care pharmacy in Chico. Owens #6 prepares prescriptions for institutional settings in five northern California counties, including mental health, assisted living, skilled nursing facilities, and the jail. In 2005, Dold applied for and received a Waste Reduction Awards Program (WRAP) award for Owens #6.

Dold started work at Owens #6 in May 2001, graduated from California State University Chico in mid-2006, and left Chico to attend pharmacy school. When he started at Owens #6, the facility was not recycling. Its waste stream included cardboard, high-density polyethylene (HDPE) and brown glass bottles, paper, packing material, foam cups, newspaper, film plastic, plasticized labels, paper towels, and employee lunchroom waste.

Landfill Overload

Dold, who began as a delivery driver, would pass by the landfill, visible from Highway 99, on his routes. One day he decided to stop in. "I grew up in this area and I used to go to the landfill with my dad," he explained. "I remembered it being a long drive to get into where you would dump your trash over the edge of this large pit. Now it isn't that far away and it's a huge mound. I could not believe it was the same place.

"The only purpose of a landfill is to keep trash, the stuff does not break down, does not go away. It is just an eyesore. Something is wrong when you have that amount of trash in a county that has less than 250,000 people."

One of the large volume items in the Owens #6 waste stream was cardboard, generated from the continuous shipments of pills, packed in cardboard boxes. Some of the boxes would be reused for shipping out, but most would go into the trash. "I looked at the environment and at what we were doing," explained Dold. "I figured if I didn't do something, who would?" He started collecting the cardboard and dropping it off on his way home in the recycling collection bins at an elementary school in Paradise.

After a few months, Dold became a stock clerk. Working inside the office, he saw more opportunities to recycle. Inside the cardboard boxes were plastic and brown glass bottles of pills sealed with film plastic and packed with foam peanuts or bubble wrap. The pills would be put into other plastic bottles and the original bottles thrown away, along with packing peanuts and other foam packaging, plastic film wrap, and shipping paperwork. Also going into the trash were bottles, cans, and newspapers that employees would bring in.

Dold noted that Federal Drug Administration regulations are sometimes waste promoting. For example, one type of antidepressant used to be shipped 500 pills to a bottle and now comes in bottles of 30 pills, using a lot more plastic.

Drug companies also contribute to waste, Dold noted. He considered petitioning manufacturing companies to discontinue the practice of putting a 1.5-inch-tall bottle into a 3.5-inch-long box. This practice is done, he explained, so that the product presumably is more visible on a retail shelf. "The waste generated by this practice does not offset the monetary gains. Putting the bottles inside of a box is a waste, period. There is no reason the bottles can't sit on the shelves by themselves."

[To Top](#)

Setting Up the Recycling Program

Dold approached the pharmacy manager and asked if he could set up a formal recycling program. The manager was supportive and Dold announced the program at one of the regular morning meetings with the 18 employees, all but 4 of whom are full-time. He explained how the new collection system would work. Most employees were receptive although few had been exposed to a similar program in other work situations.

To recycle the medicine bottles and their related packaging, Dold created a system of two trash receptacles in which a smaller one nests inside of a larger one. This made a one-container unit that fit under the counter tops, making it easy for the clerks to put the commingled recyclable pill bottles, film plastic, paper, and used packing material into the bigger trash receptacle. Nonrecyclables, including bottle caps and plasticized labels, go into the smaller one. "I wanted to make the transition to recycling as easy as possible," he explained. "If there were too many places to put items, the likelihood of everyone getting on board is lower. This setup makes it very easy for people to do their job well and recycle at the same time."



Dold also initiated reuse of the peanuts and bubble wrap, storing them in an accessible container under his counter. Employees can drop off or take the material for use. "This is not a huge part of the business," he noted, "but what we do get is used again. Our drugs come from a wholesaler in Sacramento, and arrive in plastic totes that are reused. The packaging material coming from the manufacturers is dealt with at the wholesaler's warehouse."

Cartridges for their fax machines, copiers, and computers are recycled locally or come with a printed label so that they can be sent back to the company for recycling.

Collection

On his breaks, Dold emptied the medicine bottle recycling receptacles into large 10–22 gallon plastic containers located by the facility's back door. Waste confidential and some white office paper is put in bins located near workspaces. These bins are emptied by employees into a large rolling can in the back of the office that is collected by Chico Shred twice a month for shredding and recycling. About 1 ton per year of paper is now being recycled.



One or two times a week Dold had been loading the plastic bottles, cardboard, and newspaper into his truck and dropping them off to a recycler on the way home or on the weekends. This would take him 40–60 minutes to load and unload the material, all of which was on his own time. Annually, he had been hauling about 1,400 pounds of the plastic bottles for recycling, 500 pounds of the glass bottles, and 1,200–1,400 pounds of cardboard.

As a result of Dold's efforts, in 2005, Owens #6 got a 2-cubic yard cardboard dumpster from the hauling company to collect the cardboard for recycling. At the same time, they reduced the size of their garbage dumpster from 3 cubic yards to 1.5 cubic yards. This resulted in an overall savings of \$25 a month.

After the visit by WRAP program staff, Dold contacted the waste hauler and is working on getting four to six 64-gallon bins for co-mingled collection of all recyclable materials. He is also attempting to eliminate the cardboard dumpster. "I believe we can get all of our plastic, glass, newspaper, and cardboard into a few of

these bins," he explained. "This will result in a small savings but a lot more convenience. Our representative at Waste Management, Mitch Jagoe, has been very receptive to helping us figure out what will work best for our company. He told me it's in their best interest to help make this work, because that will reduce trash to the landfill and recycle more items for future use."

Spreading the Concept

"The idea is to recycle, not necessarily to save money but to do what we can to help," explained Dold. "One of Owens Healthcare's six key values is 'giving back to community where we work and play.' And the recycling is a way to do that."

Dold credited his wife with getting him started in recycling, and then he got hooked. "It is contagious. I just kept thinking about what more I could do, what else is there?"

He became the office recycling expert. People will bring items to him and ask him if they can be recycled. People also bring in their recyclables from home, which he encourages.

Dold also inspired his fellow employees. "One of my coworkers has now become invested in waste reduction in the kitchen area and has improved the system I set up," Dold explained. "He has replaced the old bins used for cans, glass, and plastic bottles with full sized cans, making emptying easier, and cleaning up the kitchen aesthetically."

Asked about obstacles, Dold explained that the main one is the mindset. "The younger generation was taught to recycle in school," he explained. "So it was a habit taught early on. Change is harder if have being doing one thing all your life and then need to learn something new, like recycling."



"New people who come to work seem to catch on to the recycling right away. At the same time, they are surprised that we recycle because they have worked at other places where there was no recycling."

[To Top](#)

Waste Prevention and Reuse

Dold reported in his WRAP application that the pharmacy has donated fax machines to a local nonprofit organization, Computers for Classrooms, that makes necessary repairs and distributes donated electronic equipment to schools.

The company's monthly newsletter is currently mailed to each employee and given to them with their paychecks. Dold has contacted company management about discontinuing the mailing of the newsletters so that employees only get one copy. The company responded that, due to "employee feedback," they were going to stop mailing out the newsletters unless employees specifically requested that. None are being sent to the Chico employees, he noted.

There are reusable cups for employee use in the kitchen.

Environmentally Preferred Purchasing

Dold also initiated buying recycled-content copier paper and other recycled-content office products. "I started buying the highest percentage recycled content. Now others who buy paper look for the green packaging which is the recycled paper. They just assume that is what they are supposed to get."

For other office supplies, he explained that they use Office Depot's ordering system that indicates whether an item is environmentally preferred; if it is, then they will buy that item. As reported in the company's WRAP application, Owens #6 buys copier paper with 35 percent postconsumer content; toilet paper and paper towels that are 60 percent postconsumer content; plastic garbage bags that have at least 50 percent postconsumer recycled content; hanging folders that are 95 percent postconsumer content; manila folders with 30 percent postconsumer content; standard business envelopes with 40 percent postconsumer content; and clasp envelopes with 20 percent postconsumer content. None of the paper products, including the towels and toilet paper, have bleach added in the recycling process.

One of their fax machines uses cartridges that are refilled by Laser Renewsit in Chico. Dold noted that these refilled cartridges were significantly cheaper (\$40 for recycled versus \$110 for new) and the quality was fine. They also use refilled cartridges in all of their other equipment, resulting in a cost savings of \$20–\$70 per cartridge, depending upon the machine.

Owens #6 has four vehicles in its fleet. Two of these are 2005 Ford Focus wagons, which average 30 miles per gallon and are listed by the California Air Resources Board (ARB) as Partial Zero Emissions Vehicles (PZEV), which are 90 percent cleaner than average new model year vehicles.

[To Top](#)

What's Next

In anticipation of graduating and leaving the area, Dold was taking steps to institutionalize the waste reduction program he started. With the recycling, for example, he was working with the waste company to haul the recyclables as part of its regular service. "I'm trying to make it as easy as possible to recycle," he explained. "I want to make it so anyone can take the recycle bin from inside, walk out back to dump it in a recycling bin, rather than the dumpster. No sorting required." Dold was also training a coworker to operate the program.

Items left in the Owens #6 trash that could potentially be diverted from the waste stream include paper towels and lunch room waste. Dold noted in his WRAP application that they would like to reduce the number of paper towels. One possibility would be to use cloth towels. After WRAP's visit, he reported that the same co-worker, who took over the kitchen recycling, brought in a load of hand towels which are now being used in the kitchen.

Although Owens #6 promotes the use of reusable cups by employees, the company also buys styrofoam cups. "I encourage everyone to put these cups into the bins," noted Dold. "I would like to eliminate them altogether, and am still trying to figure out how to do that. Again, it's all about changing habits. We've been using disposable cups for so long, that it may take a while to get a system of glass cups/mugs to be used exclusively."

In addition to the Ford Focus wagons, the Owens #6 fleet also includes a Ford Ranger and a Subaru, neither of which is a PZEV.

Dold talked to management about trying to get a smaller car for deliveries, one that would meet PZEV standards and get high mileage. Currently none of the cars use re-refined motor oil, but Dold had planned to research this possibility.

"Overall, our recycling program is still in a fledgling stage," says Dold. "It is constantly being modified and expanded for the better. I am encouraged by the enthusiasm of my coworkers when it comes to recycling, not because it saves money, but because it's the right thing to do. The more people we can get thinking about recycling, the less likely recyclable items will end up in the trash."

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[To Top](#)

[WRAP Case Studies](#) | [WRAP Home Page](#)

Waste Reduction Awards Program (WRAP)

Waste Reduction Awards Program (WRAP): Smucker Quality Beverages, Inc.

WRAP Award Winner: 2007, 2006, 2005, 2004, 2003, 2002, 2001, 2000

- >> [Summary](#)
- >> [General Information](#)
- >> [Recycling Efforts](#)
- >> [Reuse Efforts](#)
- >> [Food Waste](#)
- >> [Environmentally Preferred Purchasing](#)

Summary

Smucker Quality Beverages (SQB) makes, bottles, and distributes about 10 million gallons a year of juices and other beverages at its 200,000 square foot plant and warehouse in Chico. SQB has been recycling since it bought the Chico facility in 1977. Starting with "the money makers" cardboard and glass, the company expanded its efforts after AB 939 passed in 1989. Today, SQB recycles, reuses, or composts about 95 percent of its waste stream, according to production manager Bob Wagner, who has been instrumental in this effort.

In 2005, SQB saved \$140,872 in avoided waste hauling and disposal costs. They received \$40,665 from selling their recyclable materials; they do not have to pay for collection or shipping of these materials. Materials include approximately 104 tons of cardboard, 199 tons of glass, 173 tons of metals, 40 tons of plastics (including PET bottles and shrink/stretch wrap), 3 tons of aluminum cans, 13 tons of office paper and magazines, and 2680 tons of fruit pulp. All but the fruit pulp are bailed on site, one of the activities on the half-acre area devoted to recycling and re-use.

SQB has just contracted to have its aseptic packaging and fruit juice-laden thick plastic bags recycled. Its hazardous materials are recycled, not just stored. This includes batteries, fluorescent light bulbs, parts cleaner, and acetone. Broken wood pallets are sold to a local company for refurbishing or sale as firewood. Apple pulp goes to a local farmer for use as cattle feed; pear and cherry pulp is used by the same farmer for animal bedding or sold by him for co-generation. Residues from tea production go to the Earthworm Soil Factory for vermicomposting.

About a third of the used 14,400 55-gallon metal drums that SQB disposes of annually are sold to local honey farmers or other businesses; the rest are crushed and recycled along with other scrap metal. Printer cartridges are recycled. Old computers or other working electronic equipment are donated to employees or recycled.

In 2005, SQB hired an on-staff waste management coordinator to oversee the recycling-reused operation and work with employees to make sure that recyclables do not end up in the trash.

SQB utilizes used furniture in its office. Their old New England-style hydraulic rack-and-cloth press was donated to a local recycling company which makes rubber matting out of used tires. SQB practices waste prevention by having systems to reduce waste on the production line and being prudent about spending.

In terms of environmentally preferred purchasing, 90 percent of the fruit SQB buys is organic. Typical for the industry, their glass bottles have recycled content as do their cardboard boxes. In 1995, SQB stopped buying Styrofoam cups and purchased a dishwasher and gave employees their own ceramic cups.

[To Top](#)

General Information

A wholly owned subsidiary of The J.M. Smucker Company, SQB makes, bottles, and distributes juices, juice blends, and teas at its 200,000 square foot plant and warehouse in Chico.

The facility, which sits on 32 acres, was purchased and modified by Knudsen & Sons, Inc. in 1977 for their juice making and bottling operation. Knudsen started making and bottling juices in 1963 as a backyard operation in Paradise, a small town near Chico.

The J.M. Smucker Company bought Knudsen in 1984 and continues to sell the R.W. Knudsen label along with Simply Nutritious and Natural Brew. In 1990, Santa Cruz Organic was purchased; that label is also made at the Chico plant. Annually, the plant bottles about 10 million gallons of carbonated and non-carbonated juices and other beverages.

WRAP interviewed Production Manager Bob Wagner in February, 2006. Wagner was hired by Knudsen as a mechanic in 1977 to work on the Chico plant. When the facility was finished, he became the plant's first production manager. Wagner has been

instrumental in developing the recycling program.

SQB employs about 135 full time employees who work out of the Chico facility; there are another 40 sales and distribution representatives who work out of other locations. About 90 percent of the employees live in Chico and the rest commute more than 20 miles to work. About 10 employees ride bikes or use public transportation; about 20 carpool and the rest drive their own cars.

Recycling Efforts

Overview

The non-hazardous items in the SQB waste stream which are currently recycled include cardboard, glass, plastic (PET) bottles, aluminum cans, plastic (PET) strapping, office paper, magazines, plastic (HDPE) pails; shrink/stretch wrap, scrap metals, 55-gallon metal drums; thick plastic bags, and aseptic packaging. All these materials are collected and bailed on site.

SQB gets a monthly quote on prices from Waste Management (Chico) and Smurfit and Stone (Sacramento), explained Wagner. They then sell a truck load of mixed bales to the one with the best price. Both companies cover the hauling and sell the materials to other vendors for actual recycling. The bales are placed on seconds pallets that would not be used for shipping out bottle juices; see pallets below.

SQB has just arranged with Waste Management to collect the 50 tons of used aseptic juice concentrate bags and the 50 tons of 2.5 mil LDPE plastic bags used to catch leaks from the 55-gallon drums. Because both items were contaminated with fruit juice, it was difficult to find a recycler to take them. These two items currently make up over half of the 191 tons that SQB has been sending to the landfill.

The metal drums make up about 90 percent of SQB's metal; the rest is mostly scrap metal from machine repairs and caps from the bottling. Metals are collected by Steelmill Supply, located in Durham, in a 20-yard bin that it supplies. Steelmill does not charge for collecting the metal, but also does not give SQB money for the material. The metal bin is collected on an average of twice a month, explained Wagner; when full it weighs 10 tons.

SQB contracts with Safety-Kleen, a company based in Texas, to recycle the materials they have that are classified as hazardous, including batteries, fluorescent light bulbs, parts cleaner, and acetone. Safety-Kleen provides SQB with the containers to collect and ship the material.

SQB's contract is for the materials to be recycled, explained Wagner, not just stored safely. Mercury gas, glass, and metals are extracted from the light bulbs and chemicals and metals from the batteries. The petroleum-based parts cleaner is filtered to remove dirt and sent back to SQB for reuse. Safety-Kleen burns the acetone to heat the kiln in its cement making plant.

Other items diverted from the waste stream through composting, reuse, or a mixture of reuse and recycling include wood pallets, fruit pulp, tea mixture residuals, 55-gallon metal drums, and used printer cartridges. Old computers or other working electronic equipment are donated to employees or are taken by Safety-Kleen. See above.

Non-diverted waste items include paper towels, employee lunch room waste, miscellaneous plastics & metals, contaminated plastics and cardboard, plastic weave bags that their sugar is shipped in, and floor sweepings. These go into go into a 30-yard compactor which is collected by Waste Management every 4-6 weeks on an on-call basis. Wagner noted that the collection frequency varies with the plant's output. There are also recyclables that end up in the trash, notes Wagner, something they are constantly working to minimize.

In 2005, Wagner reported that SQB had diverted about 95 percent of waste stream which saved about \$140,872 in avoided waste hauling and disposal costs, reducing the overall waste bill to \$10,261. Recycled materials included approximately 199 tons of glass, 104 tons of cardboard, 173 tons of metals, 40 tons of plastics, 3 tons of aluminum cans, 13 tons of office paper and magazines, and 2680 tons of fruit pulp (see Food Waste, below). SQB received about \$40,665 from sale of the recycled products.

Basics

Recycling had started at the facility when it was still owned by Knudson & Sons, Inc. "We were recycling the revenue makers, cardboard and aluminum" noted Wagner. In the early 80s they began recycling glass. In early 2000, SQB started recycling their PET bottles and another now-discontinued line of HDPE bottles, both revenue generators.

Aluminum cans, like glass and plastic bottles, enter the waste stream from the bottling process or are brought in by employees. Approximately 80 percent of the beverages go into glass bottles, 10 percent into plastic and 10 percent to aluminum cans. As these bottles and cans go through the automated machinery to be labeled and filled, any that are mechanically rejected are recycled. Occasionally, filled bottles may have labels that are crooked or not adhering properly; these go into the company store where they are sold at a significant discount to employees. Cans are pre-labeled. Product seconds are sold to employees at a discount, so they are not wasted.

The plant has two bottling lines, one for carbonated (aluminum and glass) and one for non-carbonated (glass and plastic). Only one type of beverage is filled at a time on each line; when the type of beverage is changed, unfilled bottles or cans still in the machine are removed and recycled.

Increasing Recycling Efforts post AB 939

After the passage of AB 939 in 1989, "the company took the steps to say they needed to do all they could at the plant to recycle," explained Wagner. This included both expanding the types of items that could be diverted and in making sure that all divertible material was in fact being diverted (and not ending up in the trash).

One of the things they learned early on, explained Wagner, was that they needed a bailer so that they could make their recycling efforts cost effective. They calculated the bailer would pay for itself within two years, so they bought one in the early 1990s. It actually paid for itself within 18 months from the higher prices they received for the compacted material and the reduced freight costs (because they were able to pack more into one truck load, so fewer loads were needed.)

With the bailer, they were able to double the price they were getting for their cardboard and also able to get a better price on the aluminum and PET bottles. Wagner noted that they get a price per pound on these items rather than the California redemption value. The beverage containers generated through the filling process would not qualify for CA redemption. They do lose a little bit on not getting redemption value for the containers than employees bring in, but it is not enough to make it worth separating these out.

SQB's hauler also provided 20-yard containers which enabled them to separate the more valuable white paper from mixed office papers (color paper, manila envelopes, file folders, and magazines), again resulting in a higher return.

In 1996, SQB started recycling the plastic strapping and shrink/stretch wrap used for securing the empty bottles shipped to them on pallets. Without a bailer, these materials could only be packed loosely in a container, so the amount received for the materials did not offset the cost of hauling them. Bailer-compacted materials are 8 to 10 times heavier than uncompacted ones, so a compacted bin is worth hauling.

In addition to having a bailer, SQB also has the yard space, about half an acre, to store recyclables while it assembles enough material to make compacted loads. As an example, Wagner explained that it takes fourteen 1-yard bins of plastic strapping to make one bale which would then go on the truck. If they did not have room to store the 14 bins, they would not be able to cost effectively recycle the strapping.

Getting to 100 Percent

"In 1990, we were diverting about 70 percent of what could be diverted," explained Wagner, "by 1995, we were at 80 percent and ten years later, we were at about 92 percent. But we wanted to do more."

"In January 2005, we came to a meeting of the minds about our recycling efforts. We realized that in order to have a good program, it needed to be embed it into employees. We did a big push to get workers to put the recyclables into the right containers, not to put them in the trash. Procedures are the key. And it worked, we really got the recycling rate up."

At this same time, SQB decided that recycling was so important, it was "worth a wage", noted Wagner. So they hired a person to do the recycling. SQB's Waste Management Coordinator spends about 90 percent of his time on recycling and about 10 percent on other duties. This helps to make up for the fact that other people, like Wagner, spend part of their time on recycling.

Having the coordinator on board has enabled SQB to carefully monitor what goes into the trash. Trash is collected by plant area and then checked regularly by the coordinator. If he finds recyclables in the trash, he goes directly to the people who work in the area it came from. For example, Wagner explained, they might find out that the night shift threw out plastic wrap, so they can go to that crew and get them back on board with recycling. Through this immediate feedback, bad habits don't get started and the importance of recycling is reinforced.

"A company has to be dedicated to recycling to devote resources to it, " explains Wagner, "but it also has to be worth the money in terms of savings from avoided disposal costs. We have to look at this as a money maker. When you live in California, everyone has a vested interest in doing their part to reduce waste. Yes, we want to do our part and our customers want us to do our part, but we can't stay in business if this does not make economic sense."

[To Top](#)

Reuse Efforts

Pallets

Like many companies, wood pallets that come with received goods are used again to ship out goods. SQB uses a standard Grocery Manufacturers Association (GMA) pallet. They reuse these pallets as long as they are intact. However, if they get broken, they are collected biweekly by Chico Pallet Recycling with whom SQB has contracted. That company buys the broken pallets for \$2 each.

Chico Pallet takes the pallets back to their lot and repairs them if possible for resale. If the pallets can be fixed to the GMA specifications (using hard woods for whole board repairs, no plates) SQB will buy them back. Pallets which are repaired but not to GMA standards are sold as seconds to other vendors; SQB does not use seconds.

Chico Pallet cuts up the scrap wood from the broken pallets and sells it as kindling. They also collect the sawdust and sell it for animal bedding.

Metal Drums

Monthly, SQB buys about 1200 55-gallon metal drums containing fruit concentrate. About 30 percent of the empty drums are sold to local honey farmers and other businesses for reuse. SQB can store a month's worth of drums, but when they get more than this, they crush them with the baler and put them into the metal bin for recycling.

Old Equipment

When SQB replaced their old New England-style hydraulic rack-and-cloth presses with a new press in 2002, the old press was given to Van Duerr Industries, Inc., a local company that recycles used tires. In 2002, Van Duerr was awarded a \$370,000 loan at 2.9 percent interest through the Board's RMDZ program to purchase the equipment necessary for on-site manufacturing (the product was being made in Oregon).

Van Duerr's feed stock is crumb rubber from 100 percent used tires from Orland and Los Angeles. Van Duerr used the presses to form the crumb rubber into rubber matting, ramps, landings for door entrance modification, and transition strips to connect different level flooring. Contact information: Tim Vander Heiden; 530-893-1596, www.safepathproducts.com

[To Top](#)

Food Waste

Although SQB makes some beverages using only concentrate and water, about 60 percent of the plants output utilizes either fresh fruit or herbs and spices, all of which have residual wastes.

Fruit Pulp

SQB processes three types of whole fruit: apples; pears; and black cherries. The apples and pears are processed from the end of August through March. The cherries are pressed mid-May to Mid-June.

Only one fruit is processed at a time. The fruits are off-loaded mechanically from delivery trucks into an outside machine bin where they are put through a power washer that knocks off any bruises or other soft spots. The fruit is then visually inspected as it moves through a stainless steel auger into a disintegrator where it is pureed. The discarded parts are added to other food residues which are hauled for composting (see below).

Organic rice hulls, a by-product of near-by Lundberg Family Farms, are added to the puree as a press aid explained Wagner. Press aids are commonly used to absorb the excess liquid, making the mixture thicker and more consistent so that the press has more bulk to press against, increasing the yield of juice. Without a press aid, the excess liquid would leak out before it could be pressed.

Wagner explained that they always use organic rice hulls, even if not all of the juices are organic. This is more efficient than having to maintain two stockpiles of rice, one organic and one non-organic certified. The fruit-rice mixture is then pumped into a new \$2 million computerized press which squeezes out the juice. Once the juice has been pressed out of the fruit, the remaining pulp is removed. In 2005, SQB produced 2679.3 tons of fruit pulp.

The new press made it much easier to remove the spent fruit pulp, Wagner explained. In their old press, the fruit juice was pressed through cloth with the pulp staying on top of the cloth. The cloth was then picked up by workers who would fling the pulp into a base auger. The older press took nine workers to operate, Wagner noted, and the new one takes three. With the new press, the pulp is augured from the press outside the building directly into a trailer for hauling.

When the Knudsen operation started, Russell Knudsen had a lot of land, Wagner explained. So they would load the pulp in a trailer and spread it out on the land where it would break down over time. When they moved to the new facility in Chico, they started to give it to local farmers in near-by Durham who use it for animal feed or composting.

Initially, SQB used their own trucks and trailers to haul, so it was completely free to the farmers. During the rainy season, they were sometimes not able to transport it across muddy farm roads, so they would have to landfill it. "At the most, we may have hauled to the landfill for a total of 3 months," Wagner explained.

In the mid-1980s, they made an agreement with Tony Paiva, one of the farmers who had been getting their pulp. SQBs agreed to give Paiva all the pulp as long as he would pick it up on a daily basis. Paiva started using agricultural by-products for animal feed in the 1950s, when he would dry sugar beet tailings from a local sugar mill. He started doing this with the apple pulp; some of which he would feed to his own animals and some he would sell to other farmers. The pear and cherry pulp he would dry for animal bedding.

Paiva explained that he also collects orchard cuttings, railroad ties, and other scrap wood which he chips and sells to the Pacific Oroville Power Plant and the Wheelabrator Shasta Energy Company plant in Anderson for co-generation. A few years ago, he started selling the dry pear and cherry pulp to the plants also. Paiva has a separate contract with the co-generation plants for each of the materials he sells them.

The arrangement with Paiva relieved SQB of the expense of hauling the pulp and also ensured that none of it would be landfilled. It did not, however, generate any additional revenue. SQB did make a couple of attempts to sell the pulp, but could not find a

reliable buyer, so continued the arrangement with Pavia.

Tea Residue

SQB generates residues from ginger, hibiscus, and other spices used in making bottled teas. This material was being sent to the landfill until January 2005 when SQB contacted Larry Royal of the Earthworm Soil Factory, a vermicomposting facility in Butte Valley. Wagner had originally met Royal at the CIWMB-sponsored Recycled Products Trade Show in Stockton. Although the tea residue was not an ideal material for the worm operation because of its high nitrogen content, Royal agreed to take it.

Royal started to raise earthworms in 2001 and in 2002 expanded the operation and began Earthworm Soil Factory. In 2004, Earthworm opened a new 20-acre facility near the Butte County Landfill. Earthworm was able to expand from their existing 42-acre site with a 1.9 percent CIWMB Recycling Market Development Zone (RMDZ) program for \$300,000.

SQB pays Waste Management to haul the material to Earthworm, and Earthworm charges about \$25/ton to take it. The tipping fee at the landfill is \$27/ton. SQB sends almost 63 tons of the tea residue to Earthworm annually, so they save about \$126 a year by not taking it to the landfill.

In addition to the food residue they accept from SQB, Earthworm gets yard waste from schools, commercial tree trimmers, landscape gardeners, commercial orchards, and individual households. They also get wood dust from some local wood manufacturers as well as from a plant in Rocklin. The wood dust, noted Royal, is too small to be used for co-generation. They do not accept manure.

Earthworm charges for processing to cover their handling costs, Royal explained. For clean green waste, there is no charge but if it contains debris, they charge \$4/load. They charge SQB because it requires extra processing before it can be fed to the worms.

Earthworm mulches and processes the green waste it so that it can be fed to the worms through a continuous flow system. The worm castings are then harvested and mixed to make soil amendments. "Our ultimate goal is to make healthy people," Royal explained, "we start that by building the biology of the soil so that it is healthy."

Earthworm's primary market is agriculture, as they can make blends which will help specific crops. They also sell pure castings for \$8/bag and a basic mixture which backyard gardeners can buy for \$45/cubic yards. (Contact information: Larry Royal, Wonderofworms@aol.com, (530) 895-9676.

Juice

When bottles are not properly labeled, SQB donates them to a local homeless shelter. Several hundred cases were donated in 2005 according to the WRAP application.

Occasionally, SQB is not able to bottle all of its juice in a timely manner. When this has occurred, the juice has been sold to a Bay Area company that makes vinegar. Although they are paid for the juice, sometimes it is not enough to cover transportation, but they have sent it anyway. The alternative would be to put the juice into their onsite water treatment process.

Waste Reduction Efforts

SQB has systems to minimize waste on the production line, Wagner explained. He also noted that being prudent about spending is key to waste reduction. SQB is careful about their computers, they don't buy new ones just to have the latest thing. Wagner has had his computer since 2000 and had the one before that since 1995.

Wagner also noted that in 1995 SQB stopped buying Styrofoam cups. It purchased a dishwasher and gave employees their own ceramic cups.

In 1984, SQB changed from receiving their bottles and cans in cardboard boxes to having them shipped in bulk. In this method, the bottles and cans are packed together with pieces of cardboard instead of whole boxes, and, as they are loaded, the pallet is turned and the shrink wrap is spiraled around the material to hold it in. Bulk shipping uses less cardboard but the same amount of shrink wrap, explained Wagner.

[To Top](#)

Environmentally Preferred Purchasing

Office Related Products

"SQB makes environmentally preferred purchases when such products are available," Wagner explained. "We buy the highest rate of recycled content at the best price. Currently we are getting 30 percent post consumer." SQB has been buying recycled-content paper since 2000.

SQB gets its recycled-content copier paper through the Recycled Project Purchasing Cooperative, which Wagner learned about at one of CIWMB's Recycled Product Trade Shows. "I met a representative from the Cooperative who was talking about how many trees could be saved by using recycled content paper," explained Wagner. "I went home and looked at the numbers and could see for myself that this made sense." SQB orders on line from the Cooperative, which ships out of Encinitas in southern California.

Wagner also met a representative of Pacific Copier at the Trade Show. Since then, SQB has been buying recycled printer cartridges and toners from Pacific Copier. These are shipped directly to SQB from Sacramento.

SQB has reused furniture from other plants and used cabinets they have bought from local sources.

Plant Operations

SQB buys rechargeable batteries for items where the batteries are changed frequently, such as air meters. But because rechargeable batteries do not hold their power as long as new non-rechargeable ones, they do not use them for items, like thermostats and clocks, which have batteries that would normally be changed only once a year.

Although they cost about twice as much, they use plastic bins for the apples rather than wood. Wood bins break much more easily, so do not last as long.

Bottling, Shipping

SQB buys recycled content glass bottles from California, Washington and Wisconsin, explained Pete Samuel, who coordinates the purchasing of packaging. The bottles are approximately 33 percent post-consumer and 10 percent pre-consumer.

Typical for most businesses, the cardboard boxes and trays SQB uses for packaging its bottles have recycled content. Purchased in California, the boxes average 3 percent pre- and 90 percent post-consumer recycled content, Wagner notes. SQB buys their plastic bottles in Washington; typical for the beverage industry, these do not have recycled content. The aluminum cans come from California.

SQB has experimented with recycled content bottle labels, Wagner explained, but has not yet found labels that will work. They tried 100 percent recycled-content labels but these would not adhere well, so they went to 50 percent and were still having problems with these going through the machinery to be put on the bottle. "We would have loved to have recycled content labels, but you can only do what your machinery will let you do," explained Wagner. "So we'll keep looking."

Ongoing Efforts to Buy Recycled

"We go out of their way to find recycled content" explained Wagner. "We would rather use products made from recycled resources. If we can get the quality, we will try to go to the highest rate of recycled content."

This has been challenging at times. Wagner reported complaints from people about paper towels that had a high recycled content but ripped very easily. People had also registered complaints about different recycled-content toilet papers they had tried. "You have to find a happy medium between trying to support recycled products keeping people happy, and keeping control of your costs."

Wagner is also mindful of costs, "we have our part to do, but we also have to stay in business." They bought picnic table of recycled plastic even though it was much more expensive than a wood table would have been. However, they passed on paying the high premium for recycled-content plastic recycling containers.

Buying Organic, Buying Locally

Part of SQB's environmentally preferred purchasing is of organic fruits, explains Kim Deitz, the Regulatory Compliance Manager. Ninety percent of the whole fruits they buy are organic, although only about 25 percent of the beverages they make are organic. Deitz served for five years as SQB's representative to the National Organic Standards Board, which sets standards for what types of organic pesticides, herbicides, and fertilizers will be allowed under the organic certified label. Deitz also noted that from an industry standpoint, organic production and processed foods are growing with organic apple being the largest selling organic fruit juice.

About 30 percent of the plant's output is apple juice made from California, Arizona or Washington apples that are pressed at the facility. Whole pears from Washington and California and cherries from California are also pressed for juice, making up about 5 percent of the production. The remainder comes from juice concentrates which they buy from the U.S. west coast as well as New Zealand and other locations.

Wagner also noted the transitions in the local area, "Paradise used to be big apple country." Also local organic farmers would rather sell produce in markets as they get a better price, he explained; juice apples do not get top dollar.

Future Plans for Energy Conservation

SQB plans to plan to start construction on a 22,000 warehouse in the next year. Their plans call for installing a 200-kilowatt solar system on the roof.

SQB is also working on plans for a 70-kilowatt methane turbine that will run on the gas from their waste water treatment. SQB currently treats all the waste water from the plant except sewage; most of the water is used for cleaning the food processing and bottling equipment. They currently burn off the methane gas that is produced by the breakdown of sugars in the water.

Wagner estimates that the combination of the solar and the methane turbine would meet about 25 percent of the site's energy demand.

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[To Top](#)

[WRAP Case Studies](#) | [WRAP](#)

Waste Reduction Awards Program (WRAP)

Thanksgiving Coffee

WRAP Award Winner: 2003, 2002, and 2001

Introduction

Paul and Joan Katzeff started the [Thanksgiving Coffee Company](#) in 1972 in Mendocino, California. In 1987, the company moved to its current 3-acre site in Fort Bragg that formerly housed the Noyo River Inn. The facility includes a 15,000-square-foot building with Thanksgiving's office and roasting and packing operations. Also on site are vermicomposting boxes and a 3/4-acre apple orchard.

Today, the company has 60 employees and buys and roasts about 800,000 pounds of green coffee beans a year. The supply comes from Nicaragua (200,000 pounds), Rwanda (150,000 pounds), Ethiopia (75,000 pounds), Uganda (75,000 pounds), Laos (35,000 pounds), Guatemala (75,000 pounds), and 10 additional countries in Central and South America, Indonesia, and Mexico.



Thanksgiving packages and ships coffee in 12-ounce and 5-pound multi-layered aluminum vacuum bags to individual buyers, stores, and restaurants/coffee shops that serve brewed coffee. Thanksgiving Coffee is sold at retail outlets, online, and by phone, primarily in the United States.

A multiple-year Waste Reduction Awards Program (WRAP) winner, Thanksgiving also received a [Governor's Environmental and Economic Leadership Award](#) (GEELA) in 2002.

In February 2006, Board staff interviewed co-founder Paul Katzeff and employees Peter Matlin and Ben Corey-Moran. Matlin has been with the company for 11 years and works in purchasing and procurement. Corey-Moran has been with the company for 2-1/2 years and works with the

farmers and cooperatives from whom Thanksgiving buys its coffee.

Environmentally Preferable Purchasing

Shade- versus Sun-Grown Coffee

Coffee is currently grown on about 26 million square miles within 10 degrees of the equator, according to Thanksgiving's website. According to the [World Wildlife Institute](#), "Scientists have found that in full-sun coffee plantations, the number of bird species is reduced by half and the number of individual birds is down as much as two-thirds."

Given that, according to the [National Coffee Association](#), in the U.S. in 2005, over half the 217 million adults drank coffee on a daily basis and 2,607 billion pounds of coffee beans were roasted, the potential environmental impacts from growing coffee are significant.*

Today, 70 percent of the coffee Thanksgiving buys is organic shade-grown.

Fair Trade Coffee

Growing and harvesting of coffee is very hard work, notes Katzeff, and most workers get paid very little. One of the international efforts to better conditions and wages for workers is "Fair Trade." Fair Trade is a practice that creates higher returns for those who actually do the work to produce goods in developing countries by eliminating the middle people in buying transactions and by paying higher prices. This enables small coffee producers to better support themselves and their families.

Currently 30 to 40 percent of Thanksgiving Coffee is Fair Trade Certified, noted Katzeff. The certification is done by TransFair, a nonprofit organization that has been certifying coffee sold in the U.S. as Fair Trade since 1999.

Office/Packing Supplies

According to its WRAP application, Thanksgiving buys office paper that has 30 percent postconsumer recycled content. The company's informational brochures and other printed material are printed on Living Tree Paper, which contains 50 to 90 percent postconsumer content. Thanksgiving also buys eco-friendly dish and hand soap.

Waste Prevention and Reuse

Vacuum Bags

Like most gourmet coffees, Thanksgiving uses vacuum-sealed valve bags to ship its roasted coffee. The bags, made with triple-layer aluminum and a plastic valve, "revolutionized specialty coffee as they allow shipped coffee to retain its flavor," explained Katzeff. Bagging the coffee immediately protects the flavor by keeping out air and moisture, both of which, along with heat, can

adversely affect taste.

Coffee bean roasting creates carbon dioxide, a by-product that is trapped in the bean under very high pressure, explained Katzeff. The beans will release carbon dioxide into the bag for three days. If the carbon dioxide was trapped in the bag, it would have no way to escape and the bag would explode from the pressure of the escaping gases. The plastic valve lets the carbon dioxide escape after the coffee is bagged, without letting air or moisture in.

The problem with the bags is that they are not recyclable. Katzeff has calculated that about 100,000 million of the valve bags are used by the coffee industry every year. If they were stacked 3 feet high, they would fill three football fields. Thanksgiving has promoted reuse of the bags and would like to find an alternative. see "What's Next?" below.

Since the valve bags produce a significant amount of waste, Thanksgiving prints a list of "Re-use Ideas" on its 12-ounce bags. Some ideas are using them for broken glass or light bulb disposal, as a planter for seedlings and for storing various items including wet paint brushes for next day use, seeds for gardening, bait or tackle, and pencils or crayons for school. And, quite innovatively, the bags can be used for buried treasure or as a time capsule. Thanksgiving also asks customers to send in their own ideas. The company doesn't keep records of how many bags are reused, said Katzeff.

Jute Bags, Chaff, and Coffee

The green coffee beans are shipped to Thanksgiving in 132-pound bags made of jute or hemp. The empty bags are given to gardeners who use them for weed suppression and to the fishing industry for use in cleaning boats and storing fresh-caught fish.

Monthly, the company generates about 600 pounds of chaff, the outer husk of the coffee bean that comes off in the roasting process. About 350 pounds go to gardeners; about 200 pounds, for mulch in the apple orchard; and 50 pounds, to the worms for food (see ["Roasting Coffee: Vermicomposting and Apples"](#) below).

Outdated coffee returned from retail sales is donated to the local food bank, explained Matlin.

Packaging

Thanksgiving includes syrups and flavorings from other vendors in its shipments to some of the retail outlets that sell brewed coffee which, in some cases, reduces packaging that would be needed to send those items separately.

The company reuses cardboard boxes that have been reinforced with tape for moving bags of coffee from one place to another inside the facility.

They also use shredded office paper, reused newspaper, and reused peanuts for packing the goods they ship, explained Peter Matlin. The shredded paper goes on the bottom for padding and the newspaper goes on top so that the contents don't get damaged when the box is cut open.

[To Top](#)

Recycling

Thanksgiving has two 2-cubic-yard dumpsters, both of which are emptied weekly by Waste Management, Inc. One bin contains co-mingled recyclables, including cardboard, plastic, metal, cans, and glass; the other is for garbage that goes to the landfill.

Organic Wastes

Growing Coffee: Composting and Sustainability

Growing coffee produces five times as much pulp as coffee, explained Katzeff. The pulp is a by-product of milling, which separates the fleshy part of the coffee berry from the pit. Improperly stored pulp liquid can leak into streams causing serious pollution and even kill fish. Thanksgiving encourages farmers to put the pulp on land away from water sources where it can be composted and then spread on the coffee crop.

Composting is also making coffee production more sustainable by eliminating the need for imported fertilizers. By adding animal manure to the composting berry pulp, farmers can increase the nutrient levels.

Farmers are also experimenting with ways to reduce the need for petroleum-based imports, noted Katzeff. Some farmers are feeding their animals different kinds of foods so they can produce manure that improves the compost. Another example is a farmer in Nicaragua who has developed a tincture from a fungus that was affecting the coffee beans. The farmer now inoculates the plant with the fungus, reducing the need for imported pesticides.

Roasting Coffee: Vermicomposting and Apples

Thanksgiving produces about 100 pounds of coffee grounds per month from coffee brewed for tasting and employees. Since 1999, these grounds have been composted on-site in three 3-by-6-foot worm boxes. Thanksgiving started with 1 pound of red worms, explained Katzeff, and now has millions of the crawlers.

Worms will eat half their body weight every day, noted Katzeff. The coffee grounds are collected in a bin where they sit for a few days before being fed to the worms. The worms also get chaff from the coffee roasting and leftovers from employee lunches and Thanksgiving's Mendocino Bakery.



Worm castings are removed from the boxes once in the spring and once in October before the rains come, explained Katzeff. One of three methods is used for harvesting castings:

1. Removing the cover and exposing the bin to light so that the top dries out and the worms head to the bottom; the castings are scooped out from the top.
2. Scooping out the bin contents into a volcano shaped cone; the worms migrate to the bottom and the castings are harvested from the cone top.
3. Ceasing feeding on one end of the box while placing food on the other side; the worms will move to the side with the food, and the castings are harvested from the other end.

Katzeff has a degree in pomology, the science of fruit-breeding and production. He planted an apple orchard on-site with 54 different varieties of trees. Each tree gets a bucket of worm castings in the spring around the drip line, he explained. The castings contain worm eggs, which will hatch into more worms. Chaff mulch is also placed around the trees to keep the weeds down.

Transportation Energy

The coffee beans that Thanksgiving buys from Mexico, South and Central America, and Asia are loaded on ships and transported to the Port of Oakland and then trucked by delivery companies to Fort Bragg. Coffee from Africa is trucked through Africa to Germany, explained Corey-Moran. It is then put on ships to be transported to Oakland and finally trucked to Fort Bragg. Katzeff noted that it would be more fuel-efficient if the U.S. only imported coffee from the Americas and African coffees went to Europe.

Thanksgiving uses its own trucks to deliver to Humboldt, Lake, Mendocino, Sonoma, Marin, and the San Francisco Bay Area. Shipping to other locations is done through private trucking companies that use petroleum-based diesel or oil.

Thanksgiving also works with other local companies to do cooperative transportation. For example, Caito Fisheries, Inc. delivers fish to the Bay Area and brings back Thanksgiving's coffee. Thanksgiving is also talking with retail chain stores in Fort Bragg about additional cooperative transportation arrangements.

[To Top](#)

What's Next

"We are trying to look at every component of the business that can become a model for the environment, for fair labor practice, or for sustainability," explains Katzeff. "What this company is about is trying to create models that other companies can follow."

"There is a difference between leading and following," he continues. "The leaders are pioneers, they say, there is no demand for Fair Trade coffee because no one is promoting it. The pioneer companies, who believe in economic justice as a core value of their business, promote sustainable coffee. The pioneers create the demand by educating retailers and consumers and market to those they have educated. This is very expensive and it is not healthy for a business to stay too far out ahead of the curve for too long. Creating new markets is a good way to go broke!"

"It is important to note that there is a vast difference between a sustainable company and a company that sells some sustainable products. The latter says that if consumers ask, they will carry more sustainable products. That is following. But the sustainable company leads; it refuses to offer non-sustainable products, spends time and effort to educate the retailer and the marketplace, gets the products on the shelf, and takes the risk of the public not knowing what is in front of them."

Coffee Bags

Katzeff has been working with another coffee roaster to create a compostable bag. "It looks like we may be getting close," he noted. "Once we get a compostable bag, other things can happen. We can educate our customers to compost them and we can also give people a discount to return the bags and we'll compost them."

Solar Energy

Thanksgiving has applied to the California Energy Commission for a \$500,000 grant for a solar energy system for the plant, explained Katzeff. "We received a reservation of \$79,328 for a 28,331-watt renewable energy generating system that is expected to produce 32,714 kilowatt hours per year. It would be fantastic, on the days the plant is open we would run it on solar. On the days it is closed, we would pump power back into the grid." The system should meet 44 percent of their energy needs according to the designer, Radiant Solar Technology of Ukiah.

Recapturing Heat from Roasting

Coffee is roasted at 550 degrees, and the after-burner burns off the roasting smoke at 1200 degrees. Roasting the 800,000 pounds of coffee uses about 20,000 gallons of propane a year. "We are producing 500 to 1200 degrees of heat continuously," notes Katzeff, "which is now just vented into the environment." He would like to see this heat recaptured and converted to electricity.

"This would entail getting a heat exchanger which would convert water to steam which would then turn a turbine to produce electricity," explained Katzeff. "It should be possible to do this with off-the-shelf technology. We don't have the money to do it at this time, but we are willing to offer our plant as a test site to develop this product. There are about 1200 coffee roasters in the

U.S., 20 of which are gigantic. Some of them roast as much in a day as we do in a year. So the renewable energy potential is tremendous."

*Statistics from the National Coffee Association, Sept. 13, 2006.

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[To Top](#)

[WRAP Case Studies](#) | [WRAP](#)



CalRecycle/CIWMB Waste Reduction Awards Program (WRAP)

Case Studies

The following case studies reveal some of the waste prevention methods of businesses that have received awards from the Waste Reduction Awards Program (WRAP).

- >> [Anderson Valley Brewing Company](#)
- >> [Greenfeet](#)
- >> [Owens Pharmacy #6](#)
- >> [Smucker Quality Beverages, Inc.](#)
- >> [Thanksgiving Coffee Company](#)

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