



**Chapter 12**  
**SOLID WASTE REDUCTION**  
**AND MANAGEMENT**

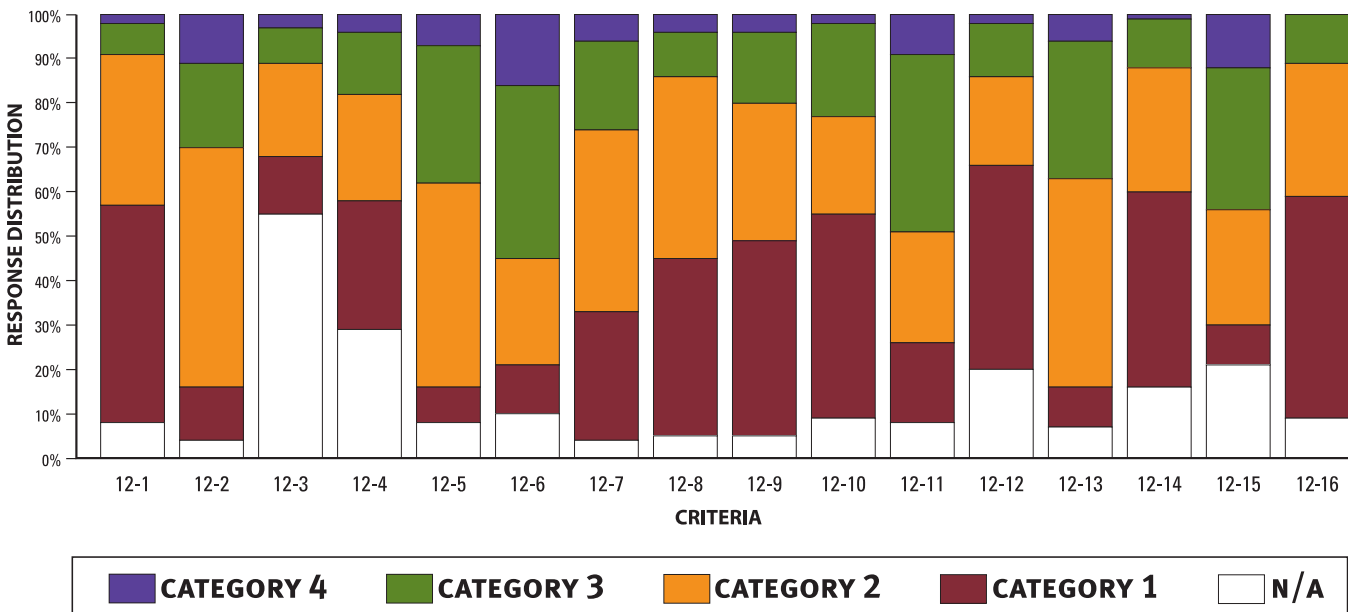
# Background

In 1989, the State of California passed AB939, mandating communities to reduce their waste generation to landfills by 25% in 1995 and 50% in 2000. Many communities were able to meet the 25% mark, but most are still having problems reaching the 50% goal. The primary reason is that while recycling efforts are underway in most California communities, the efforts are not enough to keep pace with the volume of materials being thrown away. Landfills have been closing—by 2000 there were 75% fewer landfills in the United States than in 1988—and yet each American generates about 4.51 lbs of solid waste per day.

The five main materials that make up most of the solid waste stream going to landfill are paper, plastic, metals, glass, and wood. Paper is the largest part of the waste stream. About 50% of disposed paper is diverted from landfills through recycling programs. The amount of plastic in the waste stream is growing, and only a small percentage is recycled. Recycling of glass is decreasing because it is being replaced by plastic in many beverage industries. Only about 4% of wood waste is recycled.

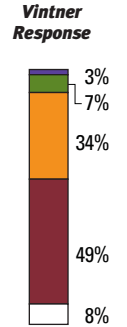
A first step to “close the loop” is to buy products and materials that contain post consumer content. Wineries are beginning to work with their suppliers to reduce the amount of packaging that comes with the materials and supplies they order. They are also helping suppliers to develop systems for reusable containers, recyclable packaging, or reprocessing of waste material.

## SOLID WASTE REDUCTION AND MANAGEMENT BENCHMARK DATA

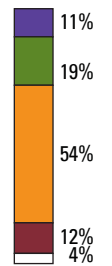


# Benchmark Data

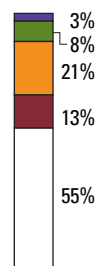
**12-1. PLANNING, MONITORING, GOALS & RESULTS** Before investing resources to reduce the amount of discarded materials, a business should begin the solid waste reduction program by assessing the amount of solid waste that the winery operation generates. This knowledge will allow for strategic planning and investment in the parts of the operation that will yield the greatest benefits for the winery and the community. 44% of the vintners report having a solid waste audit in the past 2 years. 10% have also demonstrated a solid waste reduction of at least a 25% from a per-gallon production baseline; monitor and record solid waste generation; set yearly goals; and include reduce, reuse and recycling information as part of employee training. In addition, 3% of the vintners also post the tracked information; have reduced their generation by at least 50% from a per-gallon production baseline; and make reduce, reuse and recycling information available in Spanish. 48% of vintners have no idea of the amount of solid waste they generate. 8% of vintners replied N/A, not applicable or information not available.



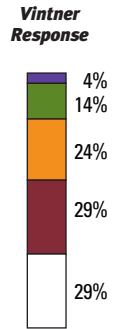
**12-2. POMACE & LEES** The crush operations at a winery are seasonal so there is a spike in the amount of organic material that the operations generate. This material is not really a “waste” but is better thought of as a “resource” that can be utilized by the winery in other ways. 11% of vintners consider pomace and lees to be “high value” resources or are conducting market assessments to identify priority byproducts; compost the material on-site; recover at least one byproduct; and make their facility available for hosting other wineries interested in byproduct recovery methods. 19% of vintners consider pomace and lees to be “medium value” resources; compost on-site or use an off-site company; visit other facilities that are recovering byproducts; and are conducting a waste assessment to identify potential byproducts. 54% of vintners consider pomace and lees to be “low value” resources; either apply the material directly to vineyards or haul off-site; and are researching technologies for extracting byproducts. 12% consider pomace and lees to be “no value” resources and dispose of the material. 4% replied N/A, not applicable or information not available.



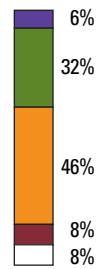
**12-3. DIATOMACEOUS EARTH** Diatomaceous Earth (DE) is used to filter wine and is part of the waste stream for some wineries. Since this material can be hazardous during handling, it is important to minimize the amount used through efficiency and to train employees on proper use and disposal. 11% of vintners know and track the amount of DE used and incorporate DE into composting operations. 3% of the vintners have also optimized DE filtration through employee training; are using alternative DE unloading technology; and are incorporating DE into composting operations after tartrate crystals have been removed (if economically feasible). 21% of vintners estimate the amount of DE they use; apply DE cakes to vineyards and research the potential for tartrate crystal recovery. 13% do not know the amount of DE they use and dispose of DE cakes in the trash as waste. 55% replied N/A, not applicable or information not available. Many wineries use other methods for filtering wine.



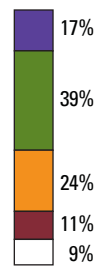
**12-4. PLATE & FRAME FILTERS** Plate and frame filters are also widely used to filter wine. 4% of vintners recycle plate and frame filters through composting or slit them open and apply directly to landscaping; research alternative disposal methods; and have contacted at least one facility implementing alternative disposal practices. 67% dispose plate and frame filters in the solid waste containers. In addition, 38% of the vintners research alternatives and 14% of vintners contact one facility implementing alternative disposal practices. 29% replied N/A, not applicable or information not available.



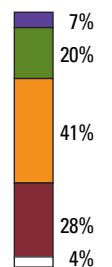
**12-5. COOPERAGE** Keeping track of the condition of barrels is important to reduce leakage and keep the barrels in use for as long as possible. Wineries should know where the wood for their barrels comes from so that they can purchase barrels made from certified sustainably forested wood. 84% of the vintners sell or recycle their used barrels. 6% of vintners also barcode the barrels to track age, use sustainable harvested wood in at least half of the barrels and donate used barrels to the community. In addition, 32% of the vintners have a formal barrel tracking system in place and are determining the percentage of barrels made from sustainably forested wood. 8% have no system for tracking the history of oak barrels and 8% replied N/A, not applicable or information not available.



**12-6. BOTTLES & OTHER GLASS** It is difficult to reduce the amount of glass used in a winery but it can be recycled. Many wineries recycle the glass from their bottling operations but there is more that can be done. 80% of the vintners are separating broken glass into recyclable and non-recyclable and disposing non-recyclable into solid waste containers. 56% of the vintners also recycle unbroken bottles and evaluate bottling operations for opportunities to reduce bottle waste. In addition, 17% of the vintners use any savings that are realized to fund employee gardens, parties or special events. 11% dispose all glass in a solid waste container. 9% replied N/A, not applicable or information not available.

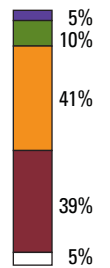


**12-7. CARDBOARD** Cardboard can best be reduced by reusing it for shipping or by working with suppliers to take it back. 68% of the vintners recycle cardboard in a designated recycling container and know the amount recycled and disposed. 27% of the vintners also track the amount of cardboard recycling; know the major sources of cardboard coming to the winery; and use the tracked information to evaluate alternative recycling programs. In addition, 7% of the vintners have convinced one major source of cardboard to take it back; track revenue from cardboard recycling; use savings on employee gardens, projects or special events; share a baler with other facilities' or implement an alternative recycling program. 28% of the vintners dispose of cardboard in the solid waste and do not know the amount they dispose. 4% replied N/A, not applicable or information not available.

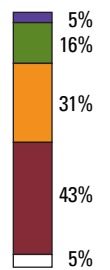


Vintner Response

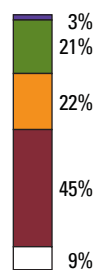
**12-8. PAPER** There are several opportunities for reducing the amount of paper used at any facility. 56% of vintners recycle paper in designated recycling containers; know how much paper is recycled and discarded; and use scrap paper for note pads before recycling. 15% of the vintners also separate paper into “mixed” and “white”; use two-sided copying as a standard practice; and circulate or email reports and newsletters instead of making copies. In addition, 5% of the vintners have implemented at least one alternative use for paper (e.g. shredding for packaging material). 39% don’t know what amount is disposed in the solid waste containers. 5% replied N/A, not applicable or information not available.



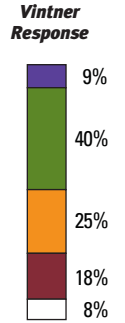
**12-9. SHRINK WRAP & PLASTIC** Plastic material is much more difficult to recycle due to the fact that there are several identification codes that designate for what purpose it can be used. Understanding these codes increases the amount of plastic that vintners can recycle. 21% of vintners have management and staff that can recognize the identification codes; recycle plastic in designated recycling containers; know and record the amount recycled; and know the major sources of plastic coming to the facility. 5% of the vintners also contract with at least one vendor specializing in plastic recycling; have convinced one major source to take back their plastic; track all revenue from plastic recycling and use any savings for employee gardens, parties and special events. 31% of vintners are confused by the identification codes; dispose of plastic in solid waste containers; estimate the amount discarded; and do not know the major sources of plastic coming to the winery. 43% dispose of plastic in the solid waste containers and don’t know the amount disposed. 5% replied N/A, not applicable or information not available.



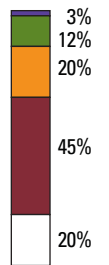
**12-10. PACKAGING** Wineries participate in the “packaging cycle” by receiving packaging and using packaging to ship wine. To reduce the amount of packaging that ends up as solid waste, the winery must know what is coming into the facility and what is going out. 24% of vintners have management and staff that can recognize packaging identification codes; use alternative packaging material; recycle packaging in designated recycling containers; know the amount recycled; and know the major sources of plastic coming to the facility. 3% of the vintners also contract with at least one vendor specializing in packaging recycling; have convinced one major source to take back their plastic; and are using fully recyclable packaging materials. 22% of vintners are confused by the packaging identification codes; dispose of packaging in solid waste containers; estimate the amount discarded; and do not know the major sources of packaging coming to the winery. 45% dispose of packaging in the solid waste containers and don’t know the amount discarded. 9% replied N/A, not applicable or information not available.



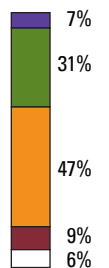
**12-11. METALS** Scrap metal can be generated in several locations around a winery. To efficiently recycle metal, all employees must know what can be recycled and where they should store the material. 49% of vintners separate metals for recycling; position recycling containers close to point of generation; train employees on metal recycling; and only dispose small pieces of metal in solid waste containers. 9% do not discard any metal into the solid waste containers. 25% separate out aluminum. 18% dispose all metal in the solid waste containers. 8% replied N/A, not applicable or information not available.



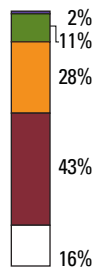
**12-12. NATURAL CORK** Natural cork is a renewable resource that is experiencing decreasing availability. Alternative reuse and recycling examples do exist but the primary challenge for wineries is to keep the cork out of the solid waste stream. 35% of the vintners make containers available in the tasting room and bottling room to recycle cork and separate cork out of the solid waste stream. 12% of the vintners have also selected an alternative to cork disposal. In addition, 3% of the vintners have implemented their selection; include cork recycling in employee training; post signs in tasting and bottling rooms about cork recycling; and do not dispose of any cork in the solid waste stream. 45% dispose of all cork in the solid waste stream. 20% replied N/A, not applicable or not available.



**12-13. PALLETS, WOOD PACKAGING & BINS** In addition to barrels, wood comes to the winery in the form of pallets and bins. Much of the material can be reused and repaired and once the useful life is spent these materials can be recycled. 85% of vintners repair and reuse pallets whenever possible, stack and store unused pallets for vendor, and have convinced one major source to take back pallets. 38% of vintners also know the major sources of pallets coming to the winery; include pallet reuse and recycling in employee training; and do not dispose of pallets in solid waste containers. 7% of the vintners also cover the store pallets and send unusable pallets to a biomass waste-to-energy system. 9% of vintners have pallets scattered throughout the facility and throw all broken pallets away. 6% replied N/A, not applicable or information not available.

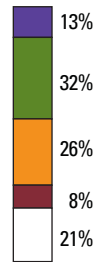


**12-14. CAPSULES** There are different kinds of capsules and some of them can be recycled; however it requires understanding the various materials and organizing the operations to include recycling options. 41% of the vintners separate and recycle their aluminum capsules. 13% also separate all capsules out of the solid waste stream; train employees in capsule recycling; make containers available in the tasting and bottling rooms for capsules; and investigate vendors that specialize in capsule recycling. In addition, 2% of vintners post signs in tasting and bottling rooms about capsule recycling; contact at least one vendor about capsule take back; and do not dispose of any capsule material in the solid waste stream. 43% dispose of all capsules in the solid waste stream. 16% replied N/A, not applicable or information not available.

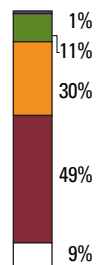


**Vintner Response**

**12-15. LANDSCAPE RESIDUALS** In addition to the pomace and lees, wineries generate organic material from the residuals from their landscape care and maintenance. 71% of the vintners leave some of the landscape residuals on the ground to naturally decompose. 45% also chip the residuals before leaving them on the ground, compost some of the residuals and do not put any into the solid waste containers. In addition, 13% of vintners chip the residuals before composting. 8% put all landscape residuals into the solid waste containers. 21% replied N/A, not applicable or information not available perhaps because some wineries outsource their grounds maintenance.



**12-16. FOOD & BEVERAGES** Many wineries have locations on-site where employees can enjoy food and beverages during their breaks. 42% of the vintners separate food and beverage waste for composting or recycling, and have a centralized recycling container for beverage cans and bottles. 12% also have a designated worker responsible for ensuring that waste is placed in the appropriate containers; food utensils and plates are made of recycled content or biodegradable plastics; and that reduce, reuse and recycle information is part of employee training. In addition, 1% of the vintners compost their food waste and utensils, and make the information available in Spanish. 49% do not have centralized recycling containers on site and dispose of all food and beverage waste in the solid waste container. 9% replied N/A, not applicable or information not available.



## Best Practices

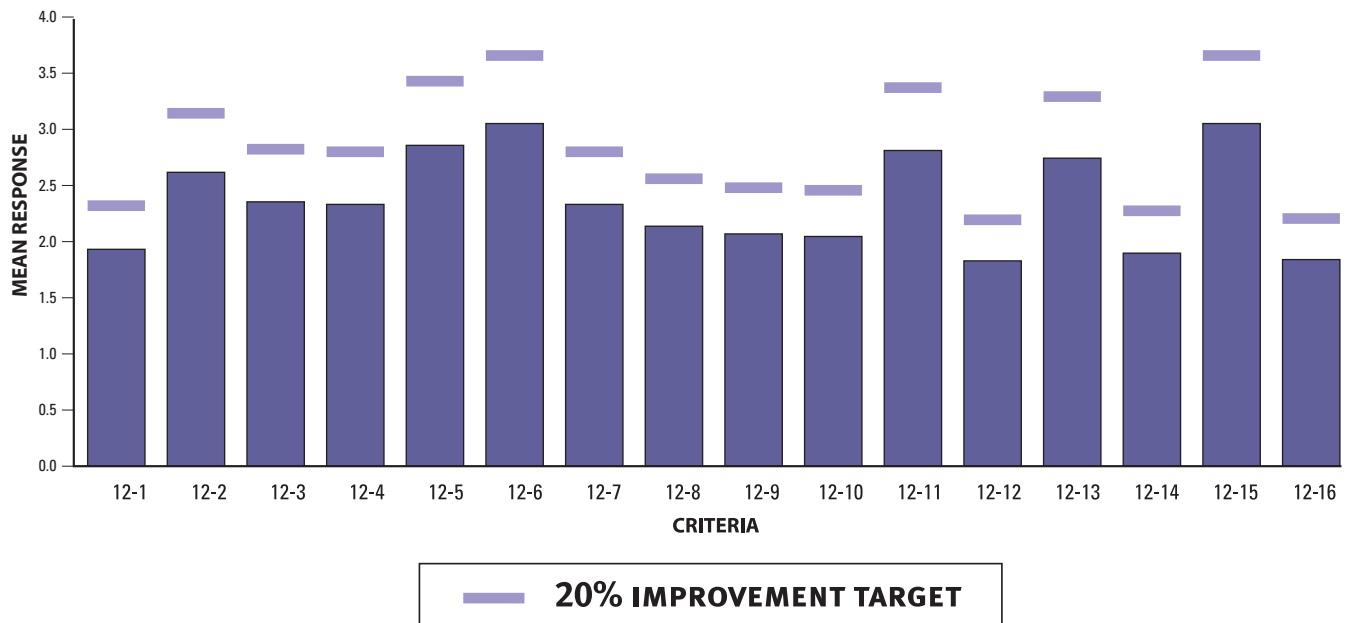
**Statewide Strengths:** In eight of the 16 criteria, 25% of vintners reported using the highest level of solid waste reduction and management practices. These criteria include pomace and lees, cooperage, glass, cardboard, packaging, metals, pallets, and landscape residues.

The Hess Collection in Napa County recycles paper, cardboard, glass, wooden pallets, plastic shrink-wrap and tons of grapes skins and stems, called pomace. The management and workers of this winery believe that recycling and composting are critical elements for the winery’s sustainability. “We are taking recycling and composting very seriously here,” says Randle Johnson, Vice President of Winegrowing and Strategic Planning. In 2003, the vineyard director purchased a heavy duty wood chipper to use not only on the Hess vineyard and landscape trimmings, but also on wooden pallets that are not recyclable. “Each year, we try to improve or implement additional programs to reduce, reuse and recycle,” says Johnson.

## Targets and Timetables

**Statewide Opportunities for Improvements:** There are opportunities for the majority of vintners to improve their solid waste reduction and management plans (criteria 12-1) as well as improve practices for handling packaging (criteria 12-10), corks (criteria 12-12), capsules (criteria 12-14) and wastes from food and beverages (criteria 12-16).

The California Sustainable Winegrowing Alliance has set a desired goal of demonstrating improvement in the scores indicated below. By harvest 2009, CSWA will strive to move the average scores to the positions marked in purple. When these goals are attained, practices will have improved from the initial benchmark averages by 20%. To reach these goals, CSWA needs partners. If you are interested in improving solid waste reduction and management practices in the wine industry, please email [info@sustainablewinegrowing.org](mailto:info@sustainablewinegrowing.org).



*“Using something again is better than using something never used before.”*

JOHN WILLIAMS, OWNER AND WINEMAKER OF FROG’S LEAP