



A DISTRIBUTION AND COST SCENARIO FOR CALIFORNIA TABLE GRAPES

**Corrugated
Common Footprint
offers best value.**

Executive summary: Using data provided by one of the largest growers and shippers of table grapes in California, the Full DisclosureSM modeling tool analyzed total annual costs involved in shipping grapes with Corrugated Common Footprint (CCF) containers versus returnable plastic containers (RPCs). The findings clearly demonstrate that corrugated offers more cost-effective packing, storing, handling and shipping than RPCs.

- Using a corrugated solution decreases overall supply chain costs by 10.3 percent. The corrugated solution realizes an overall supply chain cost advantage of \$620,000 over RPCs, or \$1.31 million annually if RPC purchase costs were amortized over their useful life.
- The retailer's system costs decrease by 14 percent with corrugated by avoiding higher RPC transportation and handling costs.
- The grower/shipper enjoys system cost savings of 7.4 percent with corrugated because CCF containers do not require either additional administrative costs or the additional packing materials of RPCs.

CORRUGATED
IT MAKES THE MOST SENSE

Conducting the California table grapes scenario.

The first table grape vineyard was planted on pueblo land near present-day Los Angeles nearly two centuries ago. Today, more than 700,000 acres of vineyards in California produce 97 percent of the United States' commercially-grown table grapes. Forecasts for 2003 project 740,000 tons in California table grape production. That translates into more than 77 million, 19-pound capacity containers to be shipped annually.

This scenario focuses on several large grower/shippers of table grapes in California's vast San Joaquin Valley; these packaging and distribution systems typify that of a large produce grower/shipper.

The subjects grow many types of table grapes, including Thompson Grapes (green seedless), Crimson Varieties (red seedless) and Red Globes (red seeded). Depending on variety, the harvest and shipping season in the San Joaquin Valley typically begins in early July and continues through November – a short season where turnaround time is critical.

The 2,800-mile trip from the grower/shipper's cold storage facility¹ to the distribution center – the approximate distance from Delano, California, (southern San Joaquin Valley) to New York City – takes about four days (approximately 96 hours). Industry standard pallet specifications were assumed.² (Figure 1)

Figure 1

Container	Stacking Pattern (containers/layer x number of layers)	Container Gross Weight (lbs)	Containers per Pallet	Full Pallet Weight (lbs)	Pallet Height; Includes 4" Pallet (inches)	Pallets per Trailer
Grapes CCF	5 per layer, 17 high	20.90	85	1,776.5	84.75	22**
Grapes RPC 1	5 per layer, 16 high	22.65	80	1,812	87.84*	22**

* Pallets with RPCs are height-constrained (in this case limited to 16 layers), due to trailer door height limitations.

** Trailers carrying both corrugated containers and RPCs are weight-constrained at 22 pallets/trailer.

CCF containers are recycled for revenue.

Once a CCF a container has served its useful purpose, it is broken down and recycled for its old corrugated container (OCC) value (\$0.06 per

grapes is limited to five months (July through November) and shipping must include up to three weeks in cold storage, each RPC only makes about 3.6 complete cycles (or "turns") per year. (Figure 2)

Figure 2



container). At this point, the corrugated container's distribution function is complete.

RPCs, on the other hand, must now enter the return trip process, which requires sorting, washing, sanitizing, warehousing and redistribution to the grower. On average, it takes 42 days for an RPC to make this round-trip, including the expensive and often time-consuming return leg. Because the harvest season for

Total cost picture is straightforward.

The Full Disclosure analysis demonstrates that distributing grapes in CCF containers is economically favorable to purchased RPCs.

CCF containers show an annual cost advantage of \$620,424, which increases to \$1,311,063 by factoring in the amortization cost of the RPCs over their useful life. In fact, if purchased, RPCs would increase

1. Grapes can spend from one day to more than three weeks in cold storage awaiting transportation to the distribution center. This impacts cycle time and decreases the number of trips an RPC can make each year, an important factor to consider given the grapes' limited growing season.
2. Costs are allocated for shipping the grapes free on board (FOB); that is, the retailer purchasing the grapes pays for the freight costs.

the overall required cash outlay in this supply chain by 11.5 percent per year, or by 24.3 percent when the cost of RPC amortization is included.

The Full Disclosure analysis shows that these higher costs are incurred in the trucking (additional \$491,029) and handling (additional \$768,315) legs – primarily due to RPC backhaul trip requirements such as washing and warehousing costs. (Figure 3)

Who pays for what?

The Full Disclosure analysis further demonstrates that rented RPCs result in significant hidden costs. (Figure 4)

- The retailer spends an additional \$617,329 each year to ship in rented RPCs, or an additional \$0.41 per container.
- The grower/shipper sees its net costs increase by \$128,188 (or an additional \$0.09 per container).³
- The RPC pool provider appears to sustain a loss of \$775,546 annually to operate this float of containers.

(CONTINUED ON BACK)

Figure 3

Corrugated Containers		Reusable Plastic Containers		Variance
Annual Container Cost:	1,410,000 \$	Annual Replenishment Cost:	567,200 \$	-842,800 \$
Annual Label Cost:	0 \$	Annual Label Cost:	165,000 \$	165,000 \$
CC Trucking Costs:	3,951,435 \$	RPC Trucking Costs:	4,442,465 \$	491,029 \$
Total trucking costs include trucking and any standing costs at unloading and loading.		Total trucking costs include trucking and any standing costs at unloading and loading.		
CC Handling Costs:	63,503 \$	RPC Handling Costs:	831,818 \$	768,315 \$
Total handling costs include unloading, handling, and loading.		Total handling costs include unloading, handling, and loading.		
CC Operating Impacts:	0 \$	RPC Operating Impacts:	0 \$	0 \$
Operating impacts are detailed at various distribution points.		Operating impacts are detailed at various distribution points.		
Disposal Cost (or Recycling Value):	-41,700 \$	Disposal Cost (or Recycling Value):	0 \$	41,700 \$
CC Inventory Value:	47,000 \$	RPC Initial Cost:	3,360,000 \$	-2,820 \$
CC Inventory Interest Cost:	2,820 \$	RPC Annual Amortization:	690,638 \$	690,638 \$
Annual CC Cost:	5,386,058 \$	Annual RPC Cost:	6,697,121 \$	1,311,063 \$
		Variance without RPC Amortization:		620,424 \$

Figure 4

Overall Summary of RPC Rental Costs vs. Corrugated							
California Table Grapes							
Cost Owner	Full Disclosure Model			Rental Costs		Total RPC	RPC Rental
	Corrugated (1)	RPC (2)	Variance (3)=(2)-(1)	Fees (4)	Other (5)	Rental Cost (6)=(2)+(4)+(5)	vs. Corrugated (7)=(6)-(1)
Pool Operator	0	1,992,146	1,992,146	(1,336,600)	120,000	775,546	775,546
Grape Grower	1,582,794	346,181	(1,236,612)	1,319,800	45,000	1,710,981	128,188
Retailer	3,803,265	4,368,794	565,529	16,000	45,000	4,420,594	617,329
Unassigned	0	0	0	0	0	0	0
Grand Total	5,386,058	6,697,121	1,311,063	0	210,000	6,907,121	1,521,063

3. This figure does not include the cost of any capital investments.

Conclusion.

By studying the impact of multiple cost drivers on different shipping container options throughout the value chain, retailers and grower/shippers can see the clear advantage of shipping grapes in CCF containers versus either purchased or rented RPCs.

Furthermore, CCF containers offer graphic benefits and display-quality printing in the retail environment. If this billboard effect could be measured in dollars, the case for corrugated becomes even stronger.

Close scrutiny reveals that pool operators bear the burden of significant extra dollars in “hidden” costs of rented RPCs. These relatively low and “subsidized” rental rates may increase over time and as pool operators feel more comfortable with their market influence.

The bottom line remains the same:
CCF containers make the most sense.



Full Disclosure was developed by the American Forest & Paper Association (AF&PA) and the Fibre Box Association (FBA). Full Disclosure is an activity-based costing software package designed to allow package buyers and users to objectively and systematically analyze shipping container alternatives by presenting the supply chain costs for each approach. The Corrugated Common Footprint Standard was developed by the Fibre Box Association and its member companies.

The Corrugated Packaging Alliance (www.corrugated.org) is a corrugated industry initiative jointly sponsored by the American Forest & Paper Association (AF&PA) (www.afandpa.org) and the Fibre Box Association (FBA) (www.fibrebox.org). Its mission is to foster the growth and profitability of corrugated in applications where it can be demonstrated, based on credible and persuasive evidence, that corrugated should be the packaging material of choice; and to provide a coordinated industry focus that effectively acts on industry matters that cannot be accomplished by individual members.



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