A DISTRIBUTION AND COST SCENARIO FOR CALIFORNIA ORANGES

Corrugated Common Footprint offers clear savings.

Executive summary: Using data provided by one of the largest growers and shippers of oranges, grapefruits, lemons and tangerines in the United States, the Full Disclosure℠ modeling tool analyzed total annual costs involved in shipping oranges 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 $502,804 with RPC purchase costs amortized, and by $658,804 if RPCs are rented.
- The retailer's system costs decrease by 13 percent with corrugated by avoiding higher RPC transportation and handling costs. Handling RPCs impacted costs significantly at the distribution center and the retailer (20 and 12 percent higher costs than CCF containers, respectively).
- The grower/shipper enjoys system cost savings of 9.1 percent with corrugated due to reduced administrative costs and the per-container cost difference between purchased 40-pound CCF containers ($1.05 each) and rented 40-pound RPCs ($1.10 each).

CORRUGATED
IT MAKES THE MOST SENSE

Conducting the California citrus scenario.

More than 16.5 million tons of citrus fruit were grown in the United States in 2000. California led the nation in the production of fresh market oranges with a 2002 crop forecast of 4.5 million tons. Citrus products grown in California are distributed throughout the world year-round.

The subject of this real-world scenario is one of the largest and oldest growers/shippers of oranges, grapefruits, lemons and tangerines in the United States. Its orchards, once less than 1,000 acres in the late 1800s, now cover several hundred thousand acres in the western United States.

The subject grows two major varieties of oranges, navel and Valencia, as well as popular seasonal specialties such as the Moro (a type of blood orange) and the red Cara Cara navel.

The packaging and distribution system used in this case scenario is typical of that of a large citrus grower/shipper and one of their actual retail ship points. The 1,150-mile trip from the grower/shipper to the distribution center – the approximate distance from Salinas, California, to Denver, Colorado – takes about 3 days (approximately 72 hours). Industry standard pallet specifications were assumed.[1] (Figure 1)

CCF containers are recycled for revenue.

Once a CCF container has served its useful purpose, it is broken down and recycled for its old corrugated container (OCC) value ($.09 per container). At this point, the corrugated container's distribution function is complete.

RPCs, on the other hand, must enter the return trip process, which requires sorting, washing, sanitizing, warehousing and redistribution to the grower. On average, it takes 30 days for an RPC to make this round-trip. Therefore, each RPC makes 12 complete cycles (or "turns") per year with an expensive and often time-consuming return leg. (Figure 2)

Total cost picture is straightforward.

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

CCF containers show an annual cost advantage of $179,500, which increases to $502,804 by factoring in the amortization cost of the RPCs over their useful life. In fact, if purchased, RPCs would increase the overall required cash outlay in this supply chain by $179,500 per year, or by 9 percent when the cost of RPC amortization is included.

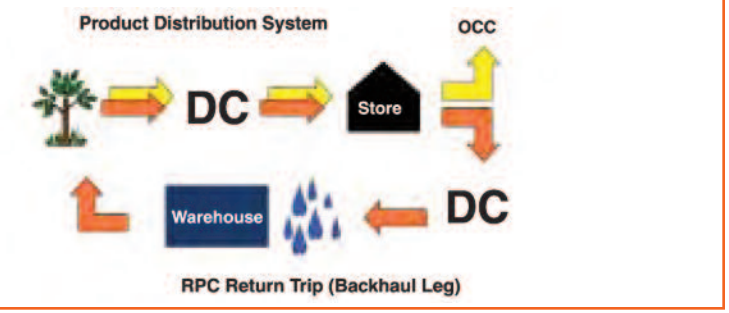
Figure 1

Container	Stacking Pattern (containers/layer x number of layers)	Container Gross Weight (lbs)	Containers per Pallet	Full Pallet Weight (lbs)	Pallet Height (inches)	Pallets per Trailer
Full-size CCF	5 per layer, 9 high	42.70	45	1,922	72	22*
RPC 2½	5 per layer, 8 high	44.72	40	1,789	81	24**

* The trailer holding CCF containers "weighs out" (is weight-constrained) at 22 pallets, or 43,362 lbs. (includes 1,100 lbs. pallet weight).

** The trailer holding RPCs weighs out at 24 pallets, or 44,136 lbs. (includes 1,200 lbs. pallet weight).

Figure 2



1. Costs are allocated for shipping the citrus free on board (FOB); that is, the retailer purchasing the oranges pays for the freight costs.

The Full Disclosure analysis shows that these higher costs are incurred in the trucking (additional $331,167) and handling (additional $812,737) legs – primarily due to RPC backhaul trip requirements such as washing and warehousing costs. (Figure 3)

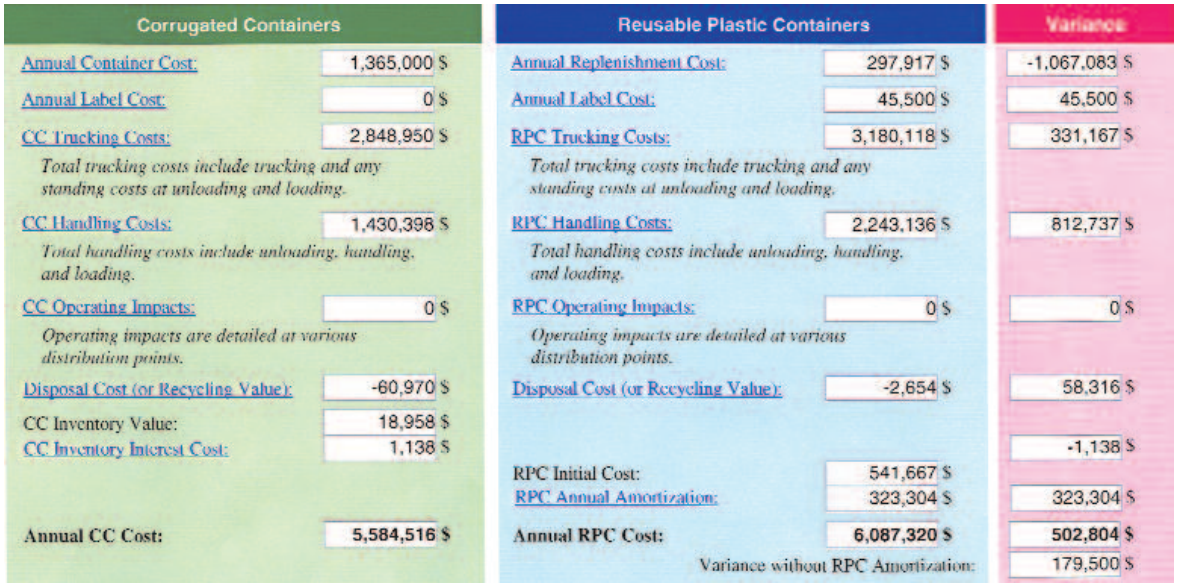
Who pays for what?

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

- The retailer spends an additional $628,774 each year to ship in rented RPCs.
- The grower/shipper pays a $1.10 per-container fee to rent RPCs (in comparison to the per-container price of $1.05 for CCF containers), and sees its net cost increase by $138,728.[2]

(CONTINUED ON BACK)

Figure 3



Corrugated Containers		Reusable Plastic Containers		Variance
Annual Container Cost:	1,365,000 $	Annual Replenishment Cost:	297,917 $	-1,067,083 $
Annual Label Cost:	0 $	Annual Label Cost:	45,500 $	45,500 $
CC Trucking Costs:	2,848,950 $	RPC Trucking Costs:	3,180,118 $	331,167 $
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:	1,430,398 $	RPC Handling Costs:	2,243,136 $	812,737 $
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):	-60,970 $	Disposal Cost (or Recycling Value):	-2,654 $	58,316 $
CC Inventory Value:	18,958 $			
CC Inventory Interest Cost:	1,138 $			-1,138 $
		RPC Initial Cost:	541,667 $	
		RPC Annual Amortization:	323,304 $	323,304 $
Annual CC Cost:	**5,584,516 $**	**Annual RPC Cost:**	**6,087,320 $**	**502,804 $**
		Variance without RPC Amortization:		179,500 $

Figure 4

Overall Summary of RPC Rental Costs vs. Corrugated

California Citrus: Common Footprint

Cost Owner	Full Disclosure Model			Rental Costs		Total RPC Rental Cost	RPC Rental vs. Corrugated
	Corrugated (1)	RPC (2)	Variance (3)-(2)-(1)	Fees (4)	Other (5)	(6)-(2)+(4)+(5)	(7)-(6)-(1)
Pool Operator	0	1,223,170	1,223,170	(1,435,868)	104,000	(108,698)	(108,698)
Major Retailer	4,206,642	4,804,721	598,080	4,694	26,000	4,835,416	628,774
Grower/Shipper	1,377,875	59,429	(1,318,446)	1,431,174	26,000	1,516,602	138,728
Unassigned	0	0	0	0	0	0	0
Grand Total	**5,584,516**	**6,087,320**	**502,804**	**0**	**156,000**	**6,243,320**	**658,804**

2. 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 citrus 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.

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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