IDENTITY PRESERVED GRAIN

- Logistical Overview -

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Table of Contents

Introduction

Is preserving the identity of grain from field to customer an economically viable marketing option? The answer to this question can only be provided by the market, more specifically, the customer you choose to serve within that market. Identity preservation covers a vast array of 'special packaging' options that may be offered by sellers or demanded by customers. Identity preservation may be as basic as providing the customer with a guarantee that a product originated from a specified region. On the other end of the spectrum, an identity preserved (IP) marketing arrangement may allow the customer to direct a farmer's variety selection, agronomic practices and commodity handling, as well as market the final product. In simple terms, identity preservation allows individual buyers to make specific demands of suppliers - a supplier may then, in turn, serve this customer by meeting these demands based on economics and marketing alternatives. The recent heightened interest in IP marketing may be attributed to several factors: (1) producers seeking means of diversifying or specializing, (2) technological advancements in communication, production, processing and marketing, (3) sophistication of customer demands, (4) low 'commodity' grain prices, and (5) refined consumer expectations.

Ron Olson, vice president of General Mills' country grain operation, recently discussed his company's ongoing commitment to aligning inputs to supply products that consistently meet and exceed customers' expectations. "General Mills estimated that of each consumer dollar spent on food, on average, inputs and seed get 8 cents; the farmer, 29 cents; country elevators and processors, 7 cents; manufacturers and finishing processors, 30 cents; and retailers (including marketing/advertising) 26 cents." Olson believes that biotechnology will shift a larger share of the profits to the front end of the channel. ('IP Grains on the Fast

Track...', 2000) In this instance of identity preservation, General Mills uses its country elevator infrastructure and select programs to partner with producers.

The opportunities for IP grain marketing have existed for decades and seem unbounded, as evidenced by the interest in this particular grain marketing channel. Expansion of the niche markets attributed to IP, domestic and international, often requires smaller amounts of grain than have typically moved through the traditional 'bulk or commercial' marketing channels. Bulk vessels filled with the specialized grain are not needed; rather smaller amounts for specified grain are supplied to fill this niche demand. Multi-cargo ships and containers are alternatives for moving smaller amounts of grain. Grain can be shipped in cargo holds or in containers filled with mini-bags, bulk bags, or a liner so that grain may be poured directly into the container.

The soybean industry holds an example of a well developed IP grain export business in its business with the Asian tofu market. U.S. producers have been shipping food grade soybeans in containers for many years now due to the premium paid and the high demand for top-quality product. Pulses, such as lentils and beans, and sunflower seeds both exemplify the shift from using traditional bulk systems to containerized movements. This has been due, in part, to decreased container rates and increased demand for higher quality product. High-value grains may follow the trend of food-grade soybeans and pulses, moving in containers rather than the traditional bulk-systems.

This study was designed to be a resource for producers, shippers, and exporters seeking to diversify their markets through IP shipments. Included are examples of markets for IP grains, trends for containerized movements of grain, and general logistical information to provide a base for understanding how one might make a successful container shipment, considering costs, services, and logistical alternatives. One component of this study is a cost

analysis and comparison of bulk versus container movements to help individuals interested in shipping by container. By downloading the spreadsheet into Lotus 123, Corel Quattro Pro, or Microsoft Excel individual costs can be entered for each component for an authentic, as opposed to a simulated, price comparison.

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Trends in Containerization

Containerized shipping developed as a result of the need to transport general cargo or product in lots too small for the traditional bulk system, as well as the need to move high-value and delicate cargo. Until the mid-1960's such cargo traveled in ship holds, loose or tied down with pieces of wood or burlap. Since this was an expensive, labor-intensive and a very slow process, the shipping costs of such a procedure were high, and shipping liners found it difficult to continue moving cargo in this manner and still make a profit. Pallets and containers were created to help reduce the costs involved with moving general cargo. Pallets can be fork-lifted directly into bulk liners or placed inside containers and are commonly used today for break bulk and container shipments.

In 1966, the first deep sea container service was introduced for the transport of general cargo. (Stopford, 1988) Since that time, container shipping has become a common way to move all types of products, especially high-value cargo. Due to decreased costs and lower rates, customer demand, and increasingly cost-efficient processes, the use of containers for seaborne cargo has seen a steady increase since its introduction in the mid 1960's.
See Table 1.

Table 1.
Seaborne Containerization Trend

Year	TEUs
1969	270,000
1979	2,650,000
1989	4,785,000
1999	11,600,000

(Source: IICL Fleet Surveys, UNCTAD Review of Maritime Transport)

Agricultural exports have seen a similar trend. Based on weight, in 1992, 9% of all US

agricultural exports moved in containers; in 1998, the number increased to 13%. (Source: PIERS, 1992 and 1998) For many specific agricultural products, such as sunflower seeds and pulses, the trend has been even greater. See Table 2.

Table 2. Bulk vs. Container Movements of Selected Agricultural Commodities*

Product	1992		1998		Change
	B	C	B	C	Containers
Sunflower Seed	38%	62%	12%	88%	+30%
Hops	2%	98%	0%	100%	+2%
Pulses (beans, lentils, peas)	34%	66%	26%	74%	+11%

**Based on weight of shipment*
B: Bulk, C: Container
Source: PIERS (Port Import Export Reporting Service), Journal of Commerce, New York, NY, 1992-1999

The examples in Table 2 represent commodities that found the bulk system of transportation unable to meet the demands of suppliers and customers. Whether it was due to a slow process, too much co-mingling, or too small quantities, the bulk system was inadequately or inefficiently transporting these products. As specialty grain markets continue to emerge, it is not unrealistic to imagine similar trends towards containerized movements.

Markets for IP Movements of Grain

Identity preserved shipments are an alternative for farmers seeking to diversify or specialize production and marketing. These IP ventures may offer a means to achieve greater profit than traditional commodity grains because the farmer is maintaining control of the product further into the marketing channel. Demand for specialized and higher-valued grains is increasing, thus creating a need for IP movements. In the past, the focus for producers has been to increase yields in order increase income. Another option has emerged. It focuses on providing the customer with a higher-valued product, services or special packaging that commands premiums which may offer higher profits to the producer. IP allows for control of the product that is necessary for ensuring a delivered product that meets customer specifications.

Whereas in the past 5 or 6 years, around 25% of wheat was exported as a “premium” cultivar, recent movements have shown shipments of nearly 60% premium quality grain with certain specifications, such as protein content. (Daugherty, T., 1998) This trend is forecasted to continue. In a survey of 200 US firms regarding the origination, storage, marketing, transportation and handling of specialty crops, 47% of the specialty grain handled went to export, rather than domestic markets. (Bender, et al, 1999) Consumer tastes are becoming more sophisticated, processing plants are becoming more automated, and technology is producing characteristics that need to be preserved for different uses and users. In response to these demands, shippers are finding it more imperative than ever to preserve the identity of grains from the farm all the way to the consumer.

There are numerous types of cultivars being developed to add value to grain for the consumer, including: low saturated fat soybeans; soybeans with altered carbohydrates that are more easily digested; organically produced grains; wheat with specified baking characteristics;

corn with high protein contents, and wheat that produces a creamy, not white, colored noodle. With so many different cultivars being produced, it is imperative that the buyer receive a product without contamination from the other cultivars. Many of these higher-value cultivars also demand better handling, less breakage and reduced shrinkage during transportation. For these reasons, and others, containerized movements of IP shipments are becoming the solution to the growing concern for properly segregating and moving specialty grain.

Containerization of specialty grains helps prevent poor handling that results from bulk transport systems. Where bulk systems require handling the grain directly three or four times, if not more, during the transportation process, grain loaded into a container is not handled until unloading at its final destination. (Prentice, B., 1998) Not only does this prevent reduced quality grain, but damage and theft problems are also minimized. Containers can be loaded and unloaded anywhere that has truck or rail has access, such as the farm, a country grain elevator, or intermodal station, and sealed until reaching the destination. International markets with theft problems, such as Zimbabwe and Botswana, where up to 20% of bulk cargo is stolen, can benefit from containerized systems as well.

In addition, the container can act as storage anywhere along the transport route. The farm or intermodal station can easily store the grain in the container until it is purchased. Ports with inadequate storage facilities will also benefit from the storage abilities of containers. Container leasing companies have quoted prices as low as 33 cents per day for leasing a container for storage. Many developing nations are unable to handle, transport or store bulk shipments of grain, making containerized shipments an effective way of moving grain into these countries, whether it is sold or sent under a food aid program.

For customers requesting a just-in-time or JIT service, container shipping is the most feasible way of meeting such demand. Whereas a shipment of grain can be harvested and

stored in a container, shipped immediately upon purchase, and arrive at the destination in as little as 3 weeks, the bulk system is much more time-intensive. Once the container is loaded for export, the time it takes to get to the export market is based only on transit times for inland and ocean transportation. Container ships have regular service to overseas ports, thus minimizing the time waiting for a vessel. See Table 3.

Table 3. Approximate Shipping Time Comparison for Bulk Handling and Containerization of Canadian Wheat*

Bulk Handling System	Days		Container System	Days
Farm Storage			Farm Storage	
Local Delivery	1		Local Delivery	1
Primary Elevator	40		Intermodal Terminal	2
Rail Hopper Cars	11		Double-stack Train	2
Export Terminal	19		Intermodal Port	2
Bulk Shipment	15		Container Ship	11
Import Terminal	10		Intermodal Port	2
Local Delivery	1		Local Delivery	1
Final Customer			Final Customer	
Total	97			21

(Prentice, B., 1998)
*(*Actual times will vary for harvest and non-harvest seasons.*)

The reduced time in transit not only offers a means of marketing for the producer that bulk systems cannot provide, but also helps to reduce costs, such as inventory holds, and increases reliability. As the Internet and other new communication technologies are realized, marketing grain directly from the farm to overseas destinations becomes more realistic. Containerization will make these direct shipments possible and timely. For these reasons, and more, producers may want to consider containerized grain movements of specialty grains as a way to diversify markets and increase profits.

Containerized Grain Shipments & Logistics

There are a variety of ways to fill and transport a container of bulk grain. One way is to base the process on the existing system used by food-grade soybean producers. Soybeans are harvested, then cleaned, separated (by size or other characteristic), graded, and bagged either on the farm or at a nearby facility. The bags of soybeans are stored in a warehouse or shipped immediately into containers delivered to the facility by the shipping line. The size of the bags and how they are loaded (palletized or in bulk bags) depends on buyer demands. Twenty-foot containers are typically used for such shipments since road weight limits prevent full utilization of a full 40-foot container.

Since bagged product incurs more costs, other options exist, as well. In Canada and Australia, wheat has been harvested and loaded directly into containers on the farm by using a canvas top container or into the back of a tilted container. Grain elevators can easily load bulk grains into the top of a canvas-topped container, as well. When loading directly into the container, whether on the farm or at the grain elevator, the container must be cleaned and sanitized or a liner should be used, due to food safety regulations. These liners range in price from $225 - $350 and add about 150 pounds to the weight. However, many containerized grain shipments have been made using sanitized containers without liners. Once loaded, the container can be moved via truck, rail or barge to the US port of departure.

Bulk movement of containerized grain is in its fledgling stages, so the market will determine the extent of its evolution, just as it has with the bulk system, over time. Demand will encourage the development of technology, equipment and facilities for this form of grain trade.

Reducing Costs Through Logistics

The bulk system has historically been a cheaper way (than container movements) of moving grain because of economies of scale and an unregulated, competitive market. (Jones and Aikens, 1999) However, due to the Ocean Shipping Reform Act of 1998, or OSRA, and vessels with increasing container capacities, container shipping is becoming a more cost-effective option for grain shipments unable to fill a bulk vessel or needing special handling. Vessels are now being constructed to carry as many as 6,000 TEUs (Twenty-foot Equivalent Units) in the upcoming year. A 6,000 TEU ship is equivalent to the number of containers in 15 double stack container trains. (Prentice, 1998) As shipping lines continue to work together to create consortiums where vessel space is shared, the number of available slots for a given trade lane on a given day also increases.

OSRA has allowed carriers to agree on service contracts with more confidentiality than in the past. This not only helps the shipper to find lower freight rates, but it also helps reduce the shipper's costs by permitting the shipper to contract specialized and guaranteed services, unavailable to products shipped under a public tariff. Although service contracts were legal before OSRA, the improved confidentiality has made them more prevalent. In November 1999, 15,000 service contracts had been filed with the Federal Maritime Commission (FMC) since OSRA passed on May 1, 1999. (Mottley, R.,1999) Other ways of reducing transportation costs, such as using freight forwarders and shippers' associations, are discussed below.

Even before the new regulations were passed, ocean shippers had been seeing the lowest rates ever for US exports to Asia and other markets over the past year. Mainly due to a trade imbalance in that trade lane, containers with lower valued cargo were moving to some markets overseas for as low $300 each. Rates fluctuate due to market influences, such as the

US trade imbalance; however, the trade imbalance is not forecasted to change dramatically in the next few years. A 40% utilization of container vessels bound for Asia is projected for the next 12 months, whereas almost 100% utilization is estimated for inbound cargo.

An example of how much ocean freight rates have decreased can be seen in the cost of moving a $250 VCR overseas. In the late 1980's, the cost was $30, or 12.5% of the cost of the VCR. In 1997, the cost was $3, or 1% of the cost of the VCR. (Muller, 1999) Similarly, shippers at the end of 1999 saw some of the lowest freight rates ever for agricultural exports, especially for exports to Asia. In just the past few years, rates for refrigerated product have decreased nearly 50%. In 1997 the rates for moving refrigerated products to many markets in Asia ranged from $3,000 to $4,000 per 40-foot container. Currently, rates for the same products are around $2,000, but have recently been as low as $1,500. (Mongelluzzo, 1999)

For the grain industry, animal feed and bagged soybean rates have witnessed similar trends. In 1995, publicly filed ocean rates for 20-foot containers of soybean from the US West Coast to Japan base ports ranged from $900 to $1,600. In January 2000, the same container rate ranged from $750 to $1,300. Similarly, for animal feed moving in containers to Japan base ports from the US West Coast, in 1995 the public rates ranged from $750 to $2,000, and in 2000, the same rates ranged from $500 to $1,850. (OceanRate Vista™, 2000)

More than just concentrating on transportation prices, however, the shipper needs to also consider all the costs of moving the product from the field to the final destination. The logistics chain offers such a means of reducing costs.

One way of reducing costs is to out-source the logistical management to a freight forwarder. A study completed in 1995 by USDA showed that almost 90% of agricultural exporters use freight forwarders for their shipments. A freight forwarder is familiar with foreign import requirements, export documentation, various shipping methods and finding the lowest

rates for an export shipment. Therefore it is no surprise that so many agricultural exporters take advantage of their services.

Also referred to as "transport architects," freight forwarders assist agricultural shippers determine the best means of moving their cargo and help decide the best route, as well as the best days for shipping. Freight forwarders coordinate storage arrangements and in-land transportation requirements, as well as assemble the necessary export documentation for the shipment, book space, and arrange for insurance.

Many freight forwarders also offer NVOCC, or Non-Vessel Operating Common Carrier services. NVOCC's are most useful to shippers in that they book large amounts of space with ocean carriers at a discount and then pass these savings onto their customers. Therefore, small shippers who cannot achieve economies of scale directly with the ocean carrier can work through an NVOCC to receive discounted rates. Although not working directly with a steamship line, shippers should evaluate the NVOCC and its services as they would an ocean carrier. For more information or to locate a freight forwarder and NVOCC, visit USDA's 'Directory of Freight Forwarders Serving Agricultural Shippers' at: http://www.ams.usda.gov/tmd/freight.

Another way to reduce costs is by pooling cargo in the form of a shippers' association. Due to the enactment of OSRA, rate-negotiating shippers' associations have gained much popularity. Since OSRA encourages a market-oriented shipping environment, volume-based service contracts can be more of a challenge for smaller shippers to achieve. Therefore, cooperative shipping provides the smaller shipper a means of achieving the same economies of scale as large shippers. Shippers' associations are not regulated by FMC; instead, legally, shippers' associations are considered a "shipper" which means that they are granted the same rights as shippers and cannot be discriminated against by ocean carriers.

Shippers' associations may also provide marine insurance and other services aside from rate negotiation, but generally do not handle any other export transportation services, such as documentation and import regulation guidance. Therefore, although shippers' associations often work directly with ocean carriers to negotiate service contracts, individual members may also work through freight forwarders and NVOCC's to arrange the shipping of their exports.

Shippers' associations have been around since the railroad made its way across the United States, but since the introduction of OSRA, many more have been formed. Some of these associations accept members shipping specific cargo or only those members shipping to or from a specific region, but most do not limit membership. Usually, there are membership fees charged to support administrative costs, but often any extra revenues accumulated are returned to the members.

For more information about shippers' associations or to locate an existing shippers' association, visit USDA's website listing shippers' associations at: http://www.ams.usda.gov/tmd/shipping.

Although the actual price of shipping by container may be higher than the traditional bulk systems, the logistics process of containerized shipping actually offers ways to reduce costs by taking advantage of many services available to shippers. Containerization may also provide a way for grain producers to even out seasonal fluctuations by storing containers directly on the farm or at a nearby facility. Also, as discussed previously, by reducing inventory holds, decreasing transit times, marketing directly to the importer, and by charging premiums for a higher-quality, better-handled product, producers can attain higher profits from containerized movements of IP grain.

Cost of Marketing Grain in Containers vs. Truck & Bulk Shipments

An economic decision model is used to illustrate potential cost differences in the identity preserved and generic marketing of raw grain. The economic decision model is based on a spreadsheet simulation of individual transportation and marketing costs. Factors considered in the model include storage, handling, transportation, marketing and special charges. The illustration included as the spreadsheet example is an export movement of soybeans from Iowa to Japan.

Storage

Storage costs are on-farm and local elevator storage costs incurred between harvest and customer receipt of product. On-farm storage is equal to 67 cents per ton per month, based on cost of capital and estimated cost of storage capacity. The elevator storage cost of $1 per ton per month is based on quoted elevator grain storage rates.

Handling

Three potential sources of handling fees are made available in the model. The farm handling charge is applicable for bushels which are moved from field to farmer-owned storage during the marketing process. The farm handling cost was estimated to be 33 cents per ton. Inland elevator handling fees are equal to that part of the elevator margin that is attributed to inbound and outbound handling, damage and loss. The inland elevator handling fees were estimated to be $2.66 per ton, or about 40 percent of the total elevator margin. The final handling charge considered in the model is the port terminal fee. Industry sources estimate the port terminal fee at $1.33 per ton.

Transportation

Several transportation components are offered as potential model inputs. The haul from field to farm is the initial movement of grain destined for on-farm or farmer owned storage. This cost was estimated to be 14 cents per ton mile based on a 1995 survey of North Dakota producers. (UGPTI, 1995) The second component, haul to elevator, may be either the initial or second movement of the grain. For grain delivered directly from field to elevator, this is the initial haul. Grain that has been moved to on-farm storage requires this additional local movement to enter commercial marketing channels. In moving grain from field or farm to an elevator facility, the farmer's grain has been placed in the commercial marketing channel. At this point, the farmer has shifted marketing risk to other participants in the grain marketing channel. A majority of grain producers in today's market continue to utilize the commercial marketing chain to deliver their product to the end-user.

Some producers, however, choose alternative logistical channels for their product, such as delivery to a domestic or foreign processor. These transactions may require truck, rail and/or container packaging of the grain, based on customer logistical requirements. Customers may also request specific product or delivery characteristics such as identity preservation, organic, scheduled delivery over time, bagged product, just-in-time delivery, etc. A supplier will agree to provide these additional services based on the revenue/cost scenarios of individual sales. Thus, it is important to make a comprehensive comparison of the cost associated with alternative marketing arrangements. The potential cost components included in the spreadsheet model are inland drayage, inland truck freight, inland rail, ocean freight, and inland/ocean freight.

The example included in the spreadsheet model simulates delivery of food-grade soybeans from Iowa to Japan. The customer requires that product be packaged in bags and delivered via container. For the purposes of illustrating a range of logistical costs that may be associated with marketing soybeans, truck, rail and ocean rates are considered for bulk and container delivery options. Transportation costs for product to be delivered via container may include drayage, rail, and ocean freight.

Drayage is included for shipments in which the producer/marketer makes container transfer to and from the grain storage site to the container handling facility. This drayage rate may be the rate negotiated by the producer marketer or a third party logistical provider. The drayage rate may be an explicit contract item or it may be included in a single comprehensive rate offered by a third party logistical firm, who coordinates the farm to foreign port movement. The inland drayage rate is estimated at 5 cents per ton mile, based on conversations with industry participants.

In the example, the in-land rail quotes for bulk soybean shipments in single car and unit train lots are based on published public rail tariff rates. These rates are specific to origin-destination pairs, so inputting of specific rate information is required for these calculations. The ocean freight component of the bulk lot shipments is based on the USDA Grain News quotes, as sourced from the *Journal of Commerce*. The single car lot movement to ship is somewhat unrealistic given the volume required for a typical ocean going grain shipments. The single car rate is included, however, to explain the wide range of transportation options available to shippers/receivers.

The final transportation cost is the in-land/ocean freight cost, which is specific to the container shipment. This rate quote refers to those comprehensive freight rates offered by shipping lines and third party providers. The $60.00/ton rate that is quoted for soybeans originated from Iowa bound for Japan is based on industry quotes. This rate may vary, as it may be a negotiated contract rate or a publicly filed tariff.

In addition, two cost components are included to allow for quantification of other charges. The first is the repositioning or “repo” charge that may be applied to make a container available to a shipper in a remote location. The second is for special handling, these charges may include bagging product or other customer specified handling components that add value/cost to the product.

Definitions

Backhaul: To haul a shipment or empty container/vessel back over part of a route it has traveled. *(APL, 1993)*

Container: Box, designed to enable goods to be sent from door to door without the contents being handled. *(Brodie, 1994)*

Drayage: Charge made for local hauling by truck. *(APL, 1993)*

FEU: (Forty-Foot Equivalent Unit) Unit of measurement equivalent to one 40-foot container; also used to quantify, for example, the container capacity of a ship, the number of containers carried on a particular voyage or over a period of time, or it may be the unit on which freight is based. *(Brodie, 1994)*

Freight forwarder: Person or company who arranges the carriage of goods and the associated formalities on behalf of a shipper. Duties include: booking space on a ship or airplane, providing all the necessary documentation and arranging customs clearance; licensed by the Federal Maritime Commission and accredited by IATA.

Identity preserved or IP: A system of production and delivery in which the grain is segregated based on intrinsic characteristics (such as variety or production process) during all stages of production, storage, and transportation. *(Rial, 1999)*

JIT: (Just-in-time) A method of inventory control where warehousing is minimal or non-existent;

the container is the movable warehouse and must arrive “just in time;” that is, not too early nor too late. *(APL, 1993)*

NVOCC: (Non-Vessel Operating Common Carrier) Person or company, often a forwarding agent, who does not own or operate the carrying ship but who contracts with a shipping line for the carriage of the goods of third parties to whom he normally issues a house bill of lading.

OSRA: Ocean Shipping Reform Act of 1998; enacted on May 1, 1999, with the intention to help equalize competition among carriers and bring new flexibility for shippers in dealing with carriers.

Shippers’ association: Nonprofit membership cooperative that makes arrangements for the movement of members’ cargo; a means by which small- and medium-sized shippers can pool cargo to obtain economies of scale and thus enjoy the benefits of volume discounts.

Repositioning: (“Repo” *(slang)*) Changing the position or location of equipment; sometimes results in repositioning charges. *(APL, 1993)*

Tariff: A publication setting forth the charges, rates and rules of transportation companies. *(APL, 1993)*

TEU: (Twenty-Foot Equivalent Unit) Unit of measurement equivalent to one 20-foot container; also used to quantify, for example, the container capacity of a ship, the number of containers carried on a particular voyage or over a period of time, or it may be the unit on which freight is based. *(Brodie, 1994)*

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Container vs. Truck & Bulk Shipment of Specialty Grains

Cost per Ton

Soybean Shipment from Iowa to Japan, via Seattle

			Container		**Truck**		**Single Car**		**Unit Train**	
	Cost per Ton	Unit for Input	Input	Cost	Input	Cost	Input	Cost	Input	Cost
Capacity		*Tons*	*20*		*25*		*90*		*4500*	
On-Farm Storage	0.67	Month	3	$2.00	3	$2.00	1	$0.67	1	$0.67
Inland Elevator Storage	1.00	Month		$0.00		$0.00	3	$3.00	3	$3.00
Farm Handling	0.33	Handle	1	$0.33	1	$0.33	1	$0.33	1	$0.33
Inland Elevator Handling	2.66	Handle					1	$2.66	1	$2.66
Port Terminal Handling	1.33	Handle			1	$1.33	1	$1.33	1	$1.33
Haul to Farm	0.14	Mile	18	$2.50	18	$2.50	18	$2.50	18	$2.50
Haul to Elevator (round-trip)	0.07	Mile		$0.00		$0.00	15	$1.07	60	$4.26
Inland Drayage	0.05	Mile	50	$2.40						
Inland Truck Freight*	0.03	Mile			3,644	$109.32				
In-land Rail	Input	Input						$30.00		$27.22
Ocean Freight	13.00	Trip			1	$13.00	1	$13.00	1	$13.00
In-land/Ocean Freight	60.00	Trip	1	$60.00						
Marketing Costs	8.00	Hour	1	$8.00	0.8	$6.40	0.2	$1.78	0.004	$0.04
Repositioning (Repo)										
Special Handling (eg bagged)										
Total Estimated Costs/Ton				**$75.23**		**$134.88**		**$56.33**		**$55.00**

*Short Ton - 2000 lb. **50% Backhaul