Perspectives of Wheat and Barley Importers on Logistics and Quality

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Introduction
Grain supply chains have been studied repeatedly from the shipper’s perspective, but the scope of such efforts usually end at the port of export (Prentice, 1998). Consequently, end-users’ views of the supply chain are subject to scant analysis. This is a reflection of the emphasis that has been placed on the problems related to farmers, but it is also a function of the difficulty in undertaking meaningful research of global markets. In addition to the problems of language and travel, it is difficult to identify a meaningful sample of importers that are representative. The literature suggests a qualitative approach, but before this could occur, one would need to know whether a problem worthy of the research investment exists.

This paper reports the results of a survey that was undertaken to assess the end-users’ perspectives of the wheat and barley supply chains. The initial purpose was to identify buyers who would be willing to participate in trial shipments of grain in ISO containers (Kosior, Prentice and Vido, 2002). A global survey was undertaken to identify potential collaborators and to explore the logistical problems of the end-users. Although agreement in principle to conduct trial shipments in containers were reached with several importers, delays and lack of cooperation on the part of the Canadian industry precluded this phase of the research. Nevertheless, the survey yielded interesting insights on the grain supply chain that suggest the export of grain in container load quantities could have great appeal to some end-users.

Methodology
The Transport Institute conducted a global survey of wheat and barley importers during the summer of 2000. Survey participants were identified through the Canadian International Grains Institute, Canadian Consular offices abroad and Internet websites. The target population included processors of wheat, durum, barley or their derivatives. Approximately 2500 companies outside North America were solicited for information. Many did not qualify, but among the numerous responses, 53 companies provided meaningful replies. A high self-selection bias makes statistical inferences about the buyers’ perspectives of the grains supply chain unreliable, although some useful insights and anecdotal observations were obtained.

The dataset was checked for internal consistencies and entered into machine-readable form. Global grains industry participants come from “all walks of life” with many differences including industrial activity, global location, size, language, etc. Many discussion-oriented or open-ended responses differed only in jargon rather than meaning. A post-field collapsing process was used to group together these responses.

Survey Results
In total 25 countries are represented in the aggregate sample. The Middle East and Africa comprise only 8 percent of the sample. Consequently, only responses from Europe, South America and Asia-Pacific are discussed in the regional analyses. Figure 1 illustrates the industrial activity of the 53 companies included in the sample. The survey was targeted at importers that were involved in milling, baking, malting, brewing or some combination. Almost three quarters of respondents process wheat into flour products. One European company manufactures dried pasta products, while the rest process barley into either malt or beer (or both). A Japanese

Figure 1: Primary Industrial Activity of Importers
beer manufacturer also produces roasted barley tea and is included in the brewing category.

**Grain Purchasing Practices**

While these companies use a variety of means to source grain, almost two thirds buy directly from grain companies. Government agencies still account for one quarter of the sales. The grain sourcing methods are illustrated in Figure 2. Although not shown, about half the respondents use more than one source for their purchases.

![Figure 2: Method of Purchasing Wheat and Barley](image)

**Factors in the Grain Purchase Decision**

Respondents were asked to rank the factors that influence their grain purchasing decisions. The results are illustrated in Figure 3. Grain quality is reported to be the most important influence on purchasing decisions, with 64 percent of respondents giving quality the first rank. Price was identified as most important by 30 percent, only six percent of respondents ranked service as the most important influence on grain purchasing decisions.

![Figure 3: Most Important Influence on Purchasing Decisions](image)

**Plant Consumption and Storage Capacity**

Daily plant consumption rates were estimated by dividing reported average storage capacity by delivery frequency. Figure 4 summarizes the daily plant consumption rates for the sample. Almost 45 percent of these companies reported low plant consumption rates (i.e. less than 200 MT/day).
Average storage capacity of the survey’s participants is illustrated in Figure 5. Fewer than half (46 percent) have a storage capacity greater than 10,000 MT. Thirty-five percent have storage capacities less than 2,500 MT.

Storage capacities vary by region. The mean storage capacity for European processors is approximately 10,000 MT, with only one quarter of the respondents above the mean. The average storage capacity for South American processors is higher at 29,000 MT, with 64 percent of respondents in this group reporting storage capacities greater than 10,000 MT. Asia-Pacific processors have the greatest amount of storage with a mean capacity of 40,000 MT. Fifty-seven percent of this group has storage capacities greater than 10,000 MT. These data would suggest that the European food manufacturers would be a best target for containerization, or a Just-in-time approach to delivery.

Supply Chain Performance
Half of the respondents indicated deficiencies with their current supply chain. This is illustrated in Figure 6. The supply chain problems vary among the Europe, South America and Asia-Pacific regions.

As presented in Figure 7, only one third of European grain processors reported experiencing difficulties with their current supply chains. Grain impurities and loose grain specifications create the biggest problems. When shipments arrive with loose specifications, recipes and production systems must be adjusted, creating delays and adding to costs. One Spanish brewer indicated that when suppliers do not adhere to the specifications, the shipment must be returned. When this happens, they have no inventory to continue production and the plant must shut down. A Norwegian miller claimed that bulk Canadian grain is occasionally blended with bulk U.S. grain in the grain terminals at the Port of Rotterdam, creating

respondents. Consequently, these issues are discussed separately for each region.

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inaccurate grain specifications. Grain impurities also add to delays and costs, as the shipment must be cleaned before production can begin.

A Norwegian brewer indicated that they would like to reduce stock levels and develop a more responsive supply chain. In addition, they would like a broader range of varieties and grain origins. The bulk transport system causes tremendous difficulty because it is unable to keep costs low with smaller consignments of varied products.

Figure 8 presents the supply chain problems reported by South American respondents. The leading complaint is bulk ship coordination. For small consignments of grain, it appears to be difficult to locate suitable ships. At the time of the survey, one Brazilian miller was in the process of developing a buying consortium with other grain importers to reduce logistics costs.

A miller in Venezuela revealed that only one berth for unloading bulk grain exists at the port and is shared by all parties. Frequently, ships must wait for the berth to become available, adding costly demurrage charges.

Lack of consistency between shipments and loose grain specifications also create significant problems for South American grain processors. Occasionally, grain arrives at the port with different quality specifications than what was originally ordered. A miller in Peru indicated that a shipment of grain was transshipped through a third country where it was commingled with other grain varieties. Costs are added when time is needed to adjust production practices between each shipment.

Poor storage capability in South America creates opportunities for containerized grain shippers. A Brazilian miller indicated severe infestation problems from January to October. This could be alleviated with containerized JIT deliveries.

Finally, a few South American grain processors complained about the effects of Mercosur. Member countries pay stiff duties on grain imported from other regions, which limits their choice. Additionally, they criticize Argentina’s
inferior classification system, on the basis that grain identity is frequently unknown and grain specifications are repeatedly inaccurate.

The logistical complaints of the Asia-Pacific grain importers are presented in Figure 9. In Asia-Pacific, half of the respondents indicated problems with their current supply chains. A miller in Japan complained that the Japan Food Agency limits the choice of grains available to processors. The JFA sets standards and purchases grain from exporters based on these standards. Consequently, it is difficult for some Japanese specialty processors to obtain unique or distinctive product specifications required for their needs.

Finally, loose grain specifications, lack of consistency between shipments and moist grain require their time and resources to adjust recipes and production systems.

The logistical problems identified by the survey’s participants were also viewed in the context of plant size (as proxied by daily plant consumption). These data are presented in Figure 10. All respondents reporting between 201 and 400 MT also reported at least some supply chain problems.

The various supply chain problems reported across the three main plant size strata are presented separately. Figure 11 presents the issues identified by companies with low daily consumption rates (200 MT/day and less). Significant problems are experienced with bulk ship coordination. This is likely because locating bulk ships suitable for small grain consignments is difficult and can be expensive. In this survey the problem seems to be exclusively South American, and readers are cautioned to recall the limited size of the group.
Figure 12 presents the logistical problems reported by the mid-sized grain importers (201-400 MT/day). This size of importers placed most focus on loose grain specifications. Depending on how one wishes to interpret their other complaints, they are primarily related to quality, rather than movement.

The logistical problems of the larger importers (greater than 400 MT/day) are presented in Figure 13. The issues raised by the largest importer group are more varied than those of the smaller importers. No doubt these complaints are also more specific to the individual situation, like the case of moist or moldy grain.

Survey respondents were asked to identify the specific supply chain improvements that they would like to see. These issues are presented in Figure 14 represent half the respondents. The surveyed importers would like greater certainty of quality and more frequent shipments. It should be emphasized that none of the participants are currently receiving grain in containers. These results however, point to a strong level of interest. Indeed, importers were identified who where willing to participate in trial shipments in containers to test their effectiveness.

It is one thing to want an improvement in the supply chain, and quite another to be willing to pay more for such improvement. The respondents were asked which improvements they would pay more to receive. These data are presented in Figure 15.

Respondents’ willingness to pay for a specific supply chain improvement provides an indication of the severity of a problem. Sixty-three percent of those respondents perceiving a need for improvements indicate that the risk of contamination is a serious problem. Whether they are giving an easy answer to a survey, or would really accept a higher price in return for higher quality, as defined by the factors identified, is not known. It certainly challenges the notion of the entrenched bulk-handling providers that they are protected by lower transportation costs.
Logistical and product quality problems threaten the profitability of some processors who operate with tight timelines and narrow margins. Vessel demurrage is a preventable expenditure. Costs incurred adjusting recipes, equipment, etc. are largely avoidable.

Many processors serve smaller niche markets. They require more specific quality attributes and more secure supply chains to guarantee the consistency of their products. While not all grain importers appear to be willing to pay higher prices for such service, a significant minority indicated that they would.

The desirability of identity preservation may extend beyond the typical notions of keeping GMO varieties of grain separate from non-GMOS in the supply chain. For example, two importers complained that U.S. grain is mixed with Canadian grain at their ports because of transshipment. In addition to loss of identity, importers complained about impurities and moldy grain. These problems could likely be avoided by containers and indicate a feature of IP grain shipping that could be employed to enhance sales.

A container system can provide temporary storage that could be desirable for some importers. A small amount of Canadian grain shipped in containers could be blended with domestic stocks without tying up limited storage space. This may be useful for millers with storage capacities less than 10,000 MT, or daily plant consumption less than 200 MT/day. Clearly, a prima facie case exists for a more in depth examination of end-user interest in a JIT container-based grain supply chain.

References


Europe: Belgium, Czech Republic, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom; South America: Brazil, Chile, Colombia, Costa Rica, Panama, Peru, Venezuela; Asia-Pacific: Japan, Malaysia, Philippines; Middle East: Oman; Africa: South Africa

*Acknowledgement: This article was derived from a study sponsored by the PFRA. The opinions expressed are the sole responsibility of the authors.