

Evaluation of Containerisation of Round Timber

1. Background

The concept of containerisation of round timber has been discussed in Britain for some time. There have been conflicting opinions about the issue: some people believe that containerisation could be a solution for timber transport in Britain and others tend to reject the idea.

The Spaven & McCrossan Partnership (David Spaven) carried out studies on containerisation in a Scottish Forest Industry Cluster funded project last year. The results give valuable technical and economic information about the concept. Manufacturers of containers have also contributed information. Borders Transport Future has, via Arthur James and John Butler, promoted containerisation of timber as a very promising idea. The problem with the work done so far in Britain is that the impact of site conditions on the use of containers has not been fully covered. It is also the case that some comparisons have not made a distinction between developing the use of rail for timber transport and developing containerised timber.

Containers are used for transport of round timber in New Zealand and some Middle European countries, especially in Austria. However, the real volume of round timber transported in containers is probably quite small so far.

Timber Transport Forum and Forestry Civil Engineering held a seminar on the evaluation of containerisation of round timber on August 19th 2002 . A group of senior personnel representing different areas of timber transport and the public interest attended the seminar. They were Tony Willis, Euroforest; Stephen Lavery, Tillhill Harvesting; David Sulman, United Kingdom Forest Product Association; Brian Harper, Forestry Contracting Association; Jamie Farquhar, Forestry & Timber Association; Ian Forshaw, Forest Enterprise; David Murray, EWS; David Eaglesham, Scottish Executive; Steven Paxton, Scottish Enterprise; David Killer, Forestry Civil Engineering (chair); Tore Högnäs, Timber Transport Forum (secretary).

Their targets were to:

- ◆ analyse the concept of containerisation of round timber;
- ◆ list the parameters for success of the concept;
- ◆ determine if these parameters exist in UK forestry; and
- ◆ decide if more research is required, leading to a demonstration project.

2. Evaluation

The group carried out a structured evaluation of the concept by listing factors for and against containerisation in all the different phases of the timber supply chain. The evaluated containerisation method was a road-rail sequence comprising use of LogRacs, the Containerlift trailer, and containerflats for rail transport. This method was compared to a typical current road-rail sequence including pre-transport to the railhead with a dedicated timber lorry and further transport to a mill in timber wagons. The group was supplied in advance with detailed material on containerisation from an expert in the field and on manufacturers of containers and other equipment. Methods of using containers were also described at the seminar. Focusing on the rail mode was justified since use of containers has typically been linked to rail transport and containers are probably most competitive when used in this mode. The LogRac – Containerlift combination was selected since this is the most tested solution in timber transport with well documented results.

3. Results

Forest Operations

With regard to forest operations there are number of arguments against containerisation. Use of containers requires there to be a concentration of timber on the site, which leads to lower production in extraction and more site and road damage. Containerisation is also less flexible with regard to natural site obstacles and has restrictions on the direction of the container, which leads to lower production in extraction and more site and road damage as well. Loading from a forwarder into a container is, probably, slower than into a pile. Use of containers requires more turning and loading space, which also means higher site costs. Management of a high number of products is difficult, which restricts the use of containers to certain locations. Timing of deliveries is probably also more difficult when containers are used.

Actually, the only benefit of containerisation with regard to forest operations is a potentially cleaner timber.

Railhead

In prehaulage to a railhead containerisation has some significant benefits. Transferring a container onto a lorry is probably faster than filling one with round timber, though this has been questioned. Unloading a container, ideally transferring it directly onto a rail wagon with a minimum of strapping, is fast. Use of ordinary lorries also increases the possibility of picking up back loads; and transporting containers does not require timber loading skills for drivers. A significant problem in prehaulage is the extra weight of the containers leading to a smaller net load. A 15 % smaller net load leads to an equal increase in the number of lorry loads. This increased number of loads is crucial since they impact on the weakest parts of the road network: forest roads and local public roads. Another consequence of the smaller net load is a significant increase in costs the farther a container has to travel. In some conditions this can 'eat' savings made by faster loading and unloading.

Rail Transportation

For rail transportation use of containers is basically a very good idea. The terminal times are shorter due to faster loading and fewer checks. Containerflat wagons can be used and higher speeds are allowed on certain routes. It may also be easier to organise the transport due to the standard format. A container is also easier to transfer to a ship or back onto a lorry. However, containers have some drawbacks: more space is needed for loading of wagons, which restricts the activity to a few railheads; there are higher capital costs for railheads; and there is a smaller wagon net load, though this is not so important for the rail leg as for prehaulage to the railhead.

At the Mill

For mill operations it is difficult to see any benefits from containers. It is probably slower to unload timber from a container than from a timber wagon. Also, more vehicles need to pass the weighbridge. With regard to unloading (and storing) filled containers there is an increased need for mill yard space and it would probably also lead to increased damage to the tarmac etc.

Timber Markets

The impact on the timber market is difficult to assess. Probably the impact is dual. Use of containers potentially restricts present markets. However, it may also open new markets that only can be accessed after several interchanges, for example taking Scottish timber to certain locations down in England or when exporting timber.

Environmental/Health & Safety Issues

When we look at Environmental and Health & Safety aspects overall, containerised timber has actually a negative environmental impact. Only if containerisation leads to a higher flow by rail can environmental benefits be achieved. New rail traffic is also a precondition for appropriation of a Freight Facilities Grant. However, there is probably a small safety advantage of having timber in containers rather than in piles.

A summary of the results is attached in Appendix 1.

4. Conclusions and Further Action

Containerisation is an excellent logistic concept, which can be used for transport of a large number of different articles. However, in British conditions it seems difficult to apply the concept to transport of round timber. Most of the problems are linked to the structure of the harvesting sites. Timber is not usually available from sites with a high concentration of timber at one point, little restriction on where to unload the forwarder, and generous space for loading and turning vehicles – all important for efficient operations with containers. Introduction of containers would, therefore, probably reduce the productivity of extraction. Another problem is also the often vulnerable forest and local public roads out of the harvesting site. Containerisation would increase the load on those roads.

The number of fractions to be kept apart on a harvesting site, and timing of operations are additional constraints. Often there can be up to 10 products to be kept apart and going to different destinations, and changes in delivery schedules are normal. Management of containerised transport in those conditions is difficult.

The trends in forestry do not support the introduction of containerisation in its present form as a future solution either. There is an increasing stress on low-impact operations taking into consideration conservation, stricter environmental restrictions, certification and an increased multiple use of forests. A more efficient utilisation of grown timber and more diversified forests will also lead to an increased number of fractions to be kept apart and often going to different destinations. The problems with local public roads are unlikely to disappear.

Containerisation is probably a good alternative when we look at the lower part of the supply chain. There are a number of advantages of having containerised timber in rail transport, and having an intermodal solution is of benefit when there is a need for additional interchanges, for instance in transferring timber for shipping. However, with present weighbridge and mill yard arrangements, receiving timber in containers is more a problem than a benefit.

Though there are major reservations with regard to transport of round timber in containers the concept is still interesting.

Firstly, this evaluation is based on typical British conditions. But timber is transported from a range of sites, and there are probably compact sites with only a few varieties of timber largely streaming to one destination. If the roads to the railheads are not a problem, a containerised system could be considered. Establishing the system is quite easy since there is equipment on the market suitable for movement of round timber. However, the group does not suggest any new demonstration projects or commercial trials of transport of round timber in containers.

Secondly, only domestic mill supply with home grown timber was evaluated. Import or export of high-value timber over long distances and several interchanges is probably the best use for containers in transport of round timber. This application needs to be explored in more detail.

Thirdly, the evaluation was restricted to round timber. Containers are probably a more promising solution for transport of by-products such as chips, sawdust and bark, as well as finished products. This is an area that clearly needs to be studied.

Fourthly, the evaluation focused only on existing methods and equipment for transport of round timber in containers. There are a number of interesting related concepts. Use of bundles as in floating in Finland is one of those concepts. Another is the use of a road friendly prehaulage vehicle gathering timber in light containers or skips from sites for further transport by lorry or, even better, by train or ship. The optimal roundwood timber container is probably not designed yet either. There is scope here for further research.

Appendix 1

Some Arguments for and Against Containerisation of Round Timber.

For Containerisation	Against Containerisation
Forest operations	
<ul style="list-style-type: none"> - Better possibilities to deliver timber free from debris 	<ul style="list-style-type: none"> - Stricter requirements on concentration of timber on the site, which leads to lower production in extraction and more site and road damage - Less flexibility with regard to natural site obstacles and has restrictions on the direction of the container, which leads to lower production in extraction and more site and road damage - Loading from a forwarder into a container is probably slower than into a pile - More turning and loading space required, i.e. higher site costs - Management of a high number products difficult, which restricts the use of the method to certain locations - Less flexible with regard to timing of deliveries
Prehaulage to the railhead	
<ul style="list-style-type: none"> - Faster loading of the lorry. However, hauliers question this. - Faster unloading of the lorry and, ideally, direct transfer to the rail wagon - The wagonloads need only to be strapped once - No timber loading skills needed for lorry driver - Better possibilities to return loads due to use of general (flatbed) lorries 	<ul style="list-style-type: none"> - Around 15 % more lorry loads on the forest roads and local public roads - The increase in costs is more significant the farther the container travels due to smaller net load - Requires investment in new equipment and containers - Less flexible with regard to time and location
Rail transport	

<ul style="list-style-type: none"> - Shorter terminal times due to faster loading and less checks - Containerflats can be used - Higher speed on certain routes - Easier to organise the transport (cf. general goods) - Easier to transfer the to a ship or back to a lorry 	<ul style="list-style-type: none"> - More space needed for loading of wagons, which restricts the activity to a few railheads - Higher capital costs for railheads - Smaller wagon net load
Mill operations	
	<ul style="list-style-type: none"> - Slower unloading by payloader - Higher number of vehicles over the weighbridge - More space needed, increased damages on the mill yard etc. if filled containers are stored
Timber market	
<ul style="list-style-type: none"> - May open new markets behind several interchanges 	<ul style="list-style-type: none"> - May restrict available markets for timber
Environmental and Health & Safety aspects	
<ul style="list-style-type: none"> - New flows may qualify for Freight Facilities Grants - Reduces stack safety problems 	<ul style="list-style-type: none"> - Negative environmental effects