

TRACTOR WIRE LOADER

Introduction

This Information Note is one of a series derived from a Technical Development Branch (TDB) Outdoor Workshop (ODW). It is produced as a guide to part of a harvesting system suitable for use in small scale broadleaved woodlands. ODWs are a TDB initiative designed to offer practical advice to practical people through presentation, demonstration and user guidance. The ODW programme will involve repeating trials and introducing new systems around Great Britain, so that a wide range of sites, systems and practitioners can be included.

Information has been gathered from equipment and method trials based at a single location. This information therefore must be taken as indicative only. Variation could be expected for other operations where factors such as terrain, crop specification, product specification, operating distances or operator efficiency differ.

The System

The tractor wire loader system (Figure 1) is based on an agricultural tractor (65 hp/4WD) fitted with an 'A' frame, pto-driven winch and loading arm. A timber trailer is attached to the draw bar of the tractor. The operator pulls out the winch rope and skid cone to the produce. He then operates the winch, using a caddy line attached to the winch, to pull the produce out of the wood. The boom attached to the 'A' frame allows the operator to lift and position the load on the trailer.

The system has the following attributes:

- Low capital cost.
- No excessive lifting of products - all lifting done by the winch/boom. Safe and ergonomic.



- Caddy line operation of the winch allows the operator to follow the load as it is extracted from the wood, from a safe position.
- Unloading is done by the use of a lifting bar and winch boom.

A 1998 case study (Table 1, Table 2 and Table 3) gave an output for the extraction system of 0.76 m³/shr. This was based on an average winching distance of 10 m and a total extraction distance of 150 m. Skid loads averaged 0.085 m³ with a mean tractor load of 1.1 m³ achieved. Costs including felling varied between £24.64/m³ at full costing to £ 8.43/m³ if costed on a marginal basis.

Various costing options may be used. The highest (A) assumes all machines and equipment are purchased new and all labour charged. The intermediate costing (B) assumes machinery and equipment has been purchased second hand and all labour is charged. The lowest costing (C) assumes that certain elements, such as capital cost of the tractor and tractor operator are not charged.

Figure 1
System Layout

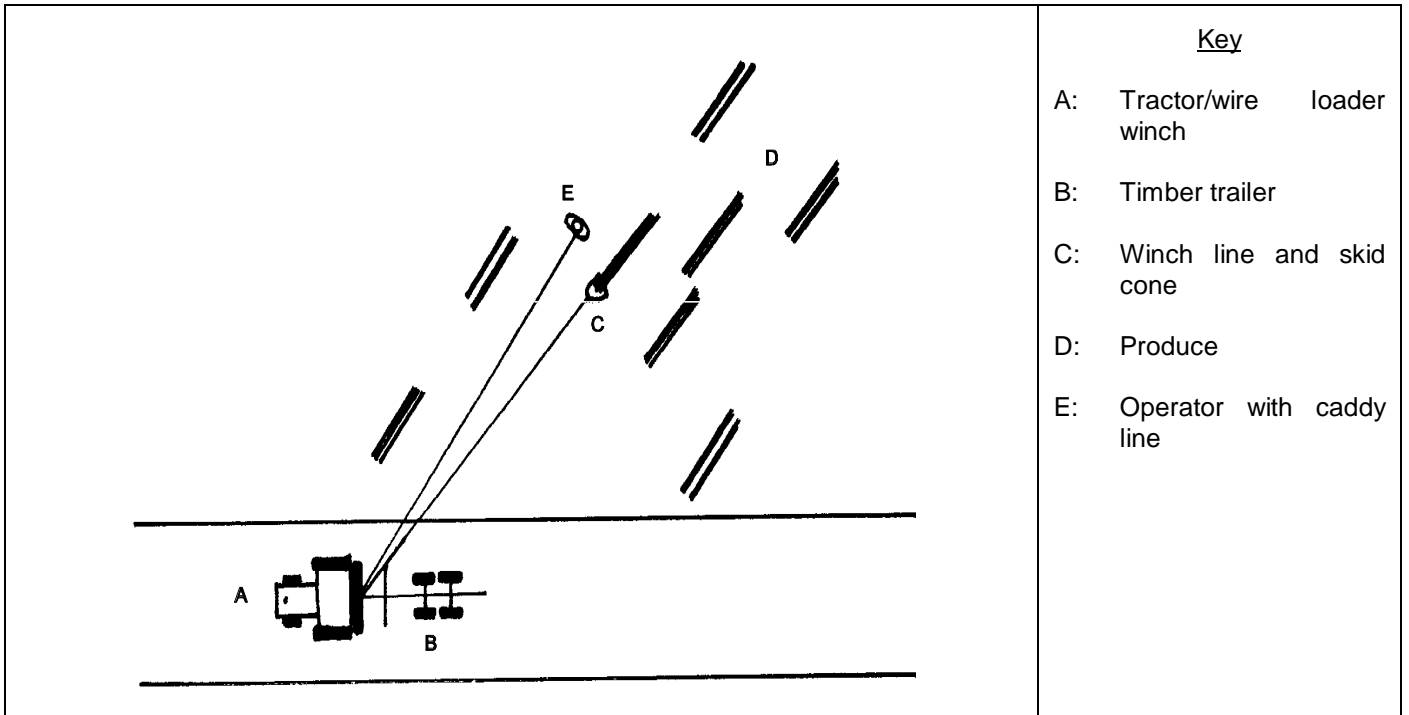


Table 1

Case Study: Site and Crop Characteristics

Soil	Free draining clay loam over shale. Depth to 200 cm+	Species	MB. syc/ash/beechnoak	Age(yrs)	Regen-130 yrs
Vegetation	Well developed herb layer with sporadic bramble, shrub layer and some regen	Form	Some good stems, but generally poor, squirrel damage.		
Terrain	Slope 15% - 45% with occasional steep snap falling to a level area adjacent to a stream	Thinning volume (m ³ /ha)	Average of 50 across site		
Access	Loosely metallated farm tracks running up/down hill on either side of wood. Roughly surfaced track in upper wood. Unsurfaced narrow track in lower wood.	Average tree (m ³)	0.113	Average Piece (m ³)	0.024

Table 2

Case Study: System Description and Costings

Item	Specification	Capital Cost (£)	Cost (£/hr)		
			(A=Full, B=Intermediate, C=Marginal)	A	B
Tractor	MF 265, 4x4	22 000	4.82	1.87	0.50
Wire loader	'A' framed Star Wire Loader, with optional hydraulic swinging boom.	2 500	0.39	0.39	0.39
Trailer	Nyvan single axle double wheeled trailer. Adjustable bed and bolster pins.				
Operator	£64.00/day on 8 hour day	-----	8.00	8.00	----
Felling	Man £8.00/hr. Saw £1.00/hr	-----	9.00	9.00	9.00
Total			22.21	19.26	9.89

Table 3

Case Study: Outputs and Unit Costs

		Cost (£/m ³)		
Study Area	Output (m ³ /shr)	A	B	C
Felling	1.24	7.26	7.26	7.26
Extraction	0.76	17.38	13.50	1.17
Total System Cost		24.64	20.76	8.43
shr = Standard Hour (Includes allowances of 17% for Personal Needs and Rest, and 16% for Other Work such as refuelling). All outputs are for skilled and accustomed operators.				

Comments on Trial Performance

A simple and effective ergonomically designed system for extraction of timber using a tractor mounted winch and trailer. The use of the wire loader greatly reduces the manual handling of loading and unloading timber.

Outputs for this system were reduced due to the following factors:

- The local market required 2.3 m billets. This length was shorter than the optimum 3 m to 4 m for the system.
- The shape of the billets was poor. Bent material prevented good stacking on the trailer and consequently the unloading mechanism could not perform properly.

- The fellers were inexperienced in the system. This meant that the presentation was not ideal. Many piles had produce as bearers or contained too few/many pieces for optimum working.
- Brush left in piles on, or in front of stacks slowed chokering.

Presentation of produce at c. 45° to the rack, on bearers, helps with chokering and extraction.

Although this is a relatively simple system, only persons with correct training and relevant experience should undertake this work.

Associated TDB Publications

Information from ODWs will be published by the Forestry Commission. Associated publications available now are:

- Report 03/95 Evaluation of Tractor Based Wire Loader Forwarder
- Technical Note 4/97 Wire Loader Horse Forwarder

Equipment Supplier

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