

Lowering forwarding costs: calculating decrease in forwarder distance due to lower number of assortments and stand area partition

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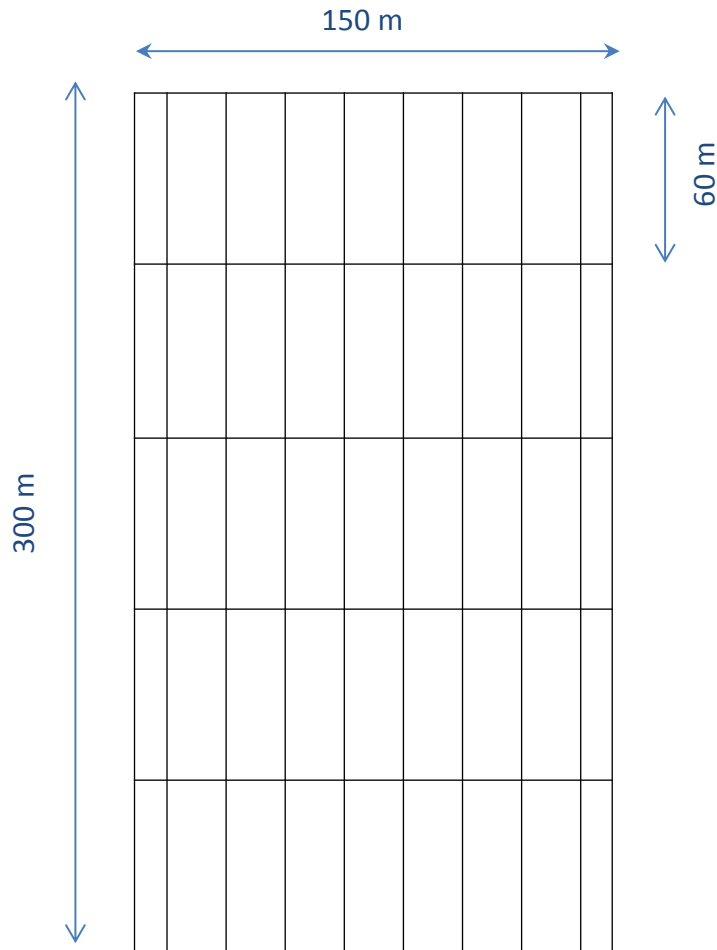


- How much thinnings?
- Service price per m³ of extracted timber
- Large area of stands for thinnings with different access for lorries (roads)
- High competition between forest enterprises

Presentation content:

- Hypothetical stand conditions
- Scenario 1: two different assortments were extracted (FD2) instead of four (FD4), but to one landing area (1LA) in each case
- Scenario 2: the stand area was divided into two zones from which timber was extracted (as two and four assortments) to two separate landing areas (2LAs).
- Results
- Conclusions

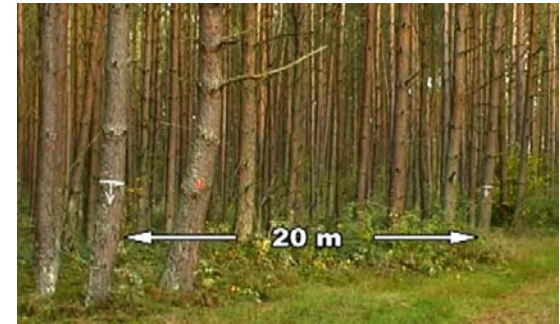
Hypothetical stand conditions



- plot: 4,5 ha, 150 x 300 m
- stocking: 300 m³/ha
- thinning: 30%, 90 m³/ha, 405 m³

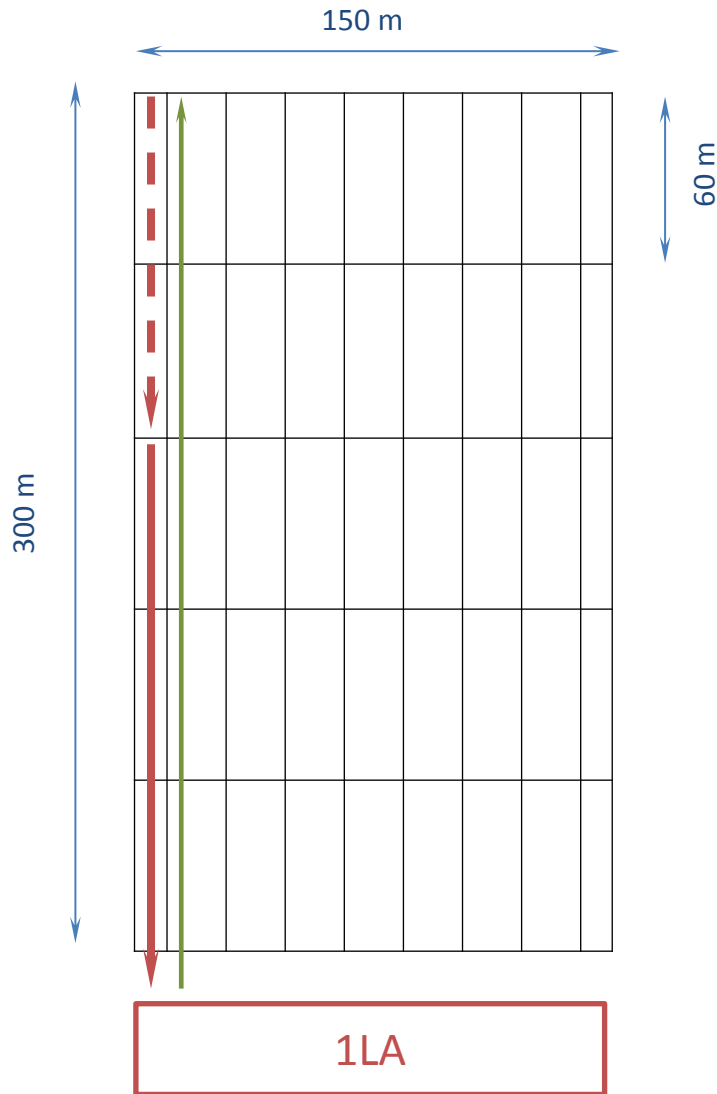
- two assortments: A1 and A2 (50% each) or
- 4 assortments: a1, a2, a3 and a4, 25% each
- forwarder 10 t (10 m³)

- strip roads:
every 20 m



- total strip roads length: 2 400 m (300 m x 8)
- timber: 0,17 m³/m of strop road
- 59,26 of loading drive for 10 m³ of timber

- **ca 60 m = full load**

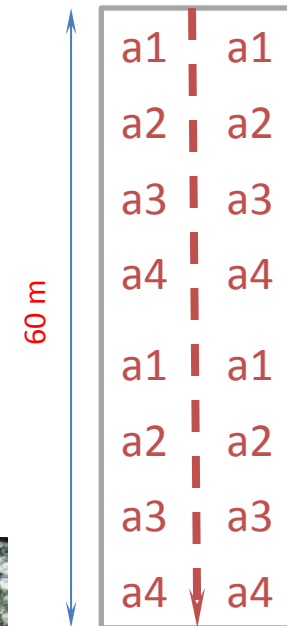


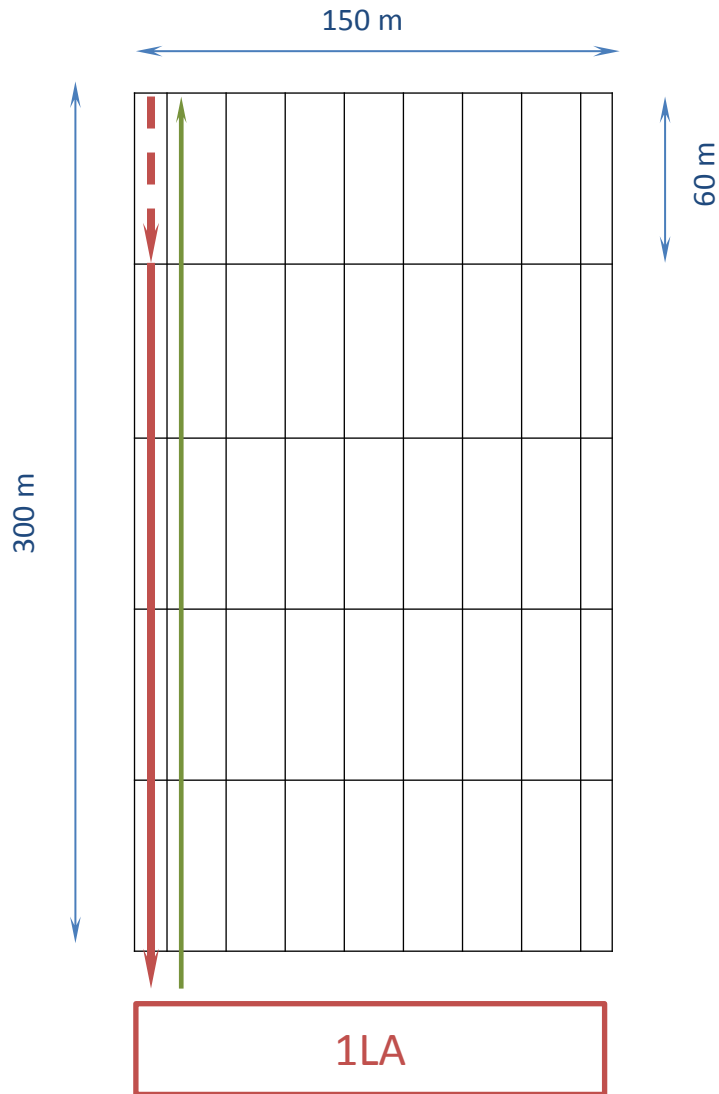
SCENARIO 1

1LA-FD4

➤ when four assortments: a1, a2, a3 and a4 were extracted, each amounting to **25%** of the total harvested timber (THT),

➤ one load = 120 m

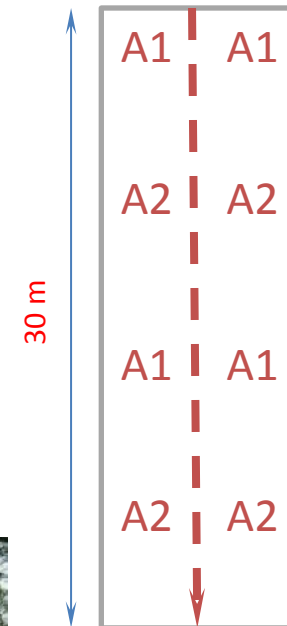


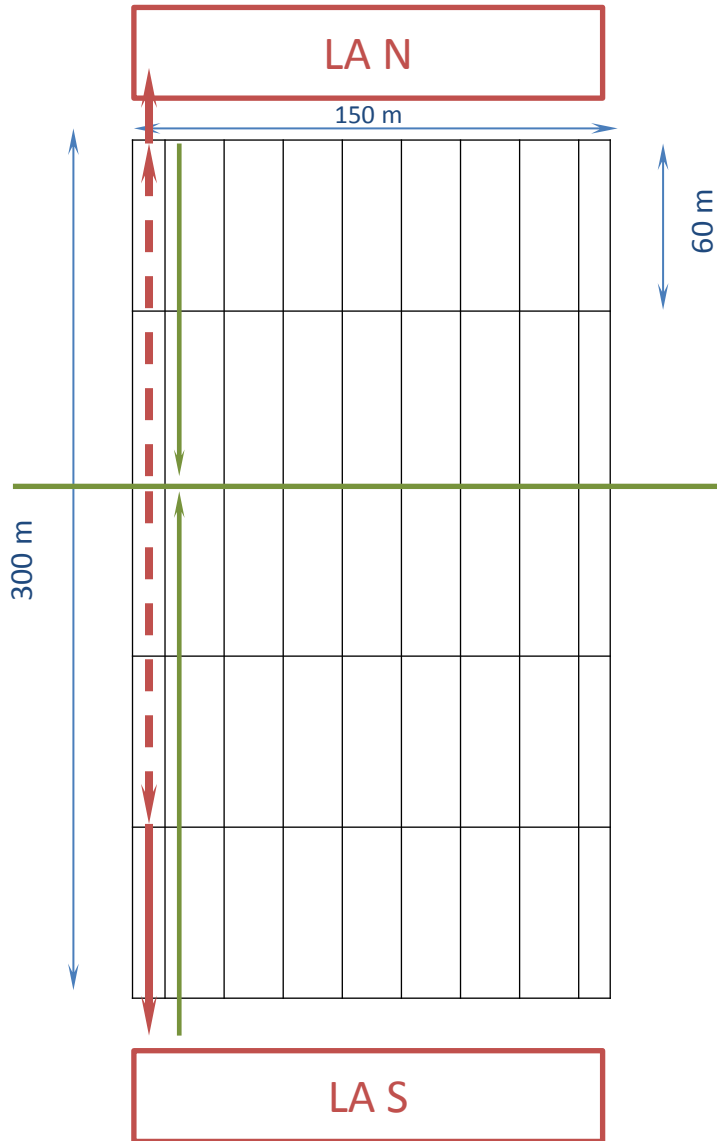


SCENARIO 2

1LA-FD2

- when two assortments: A1 and A2 were extracted, each amounting to 50% of the total harvested timber (THT),
- one load = 60 m

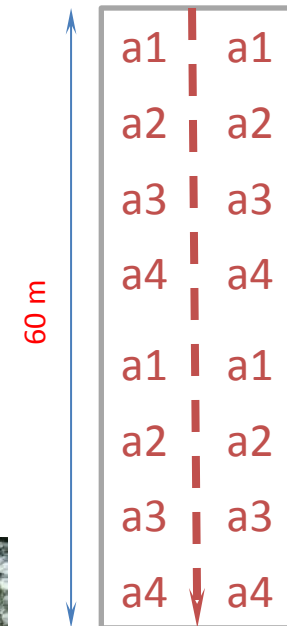


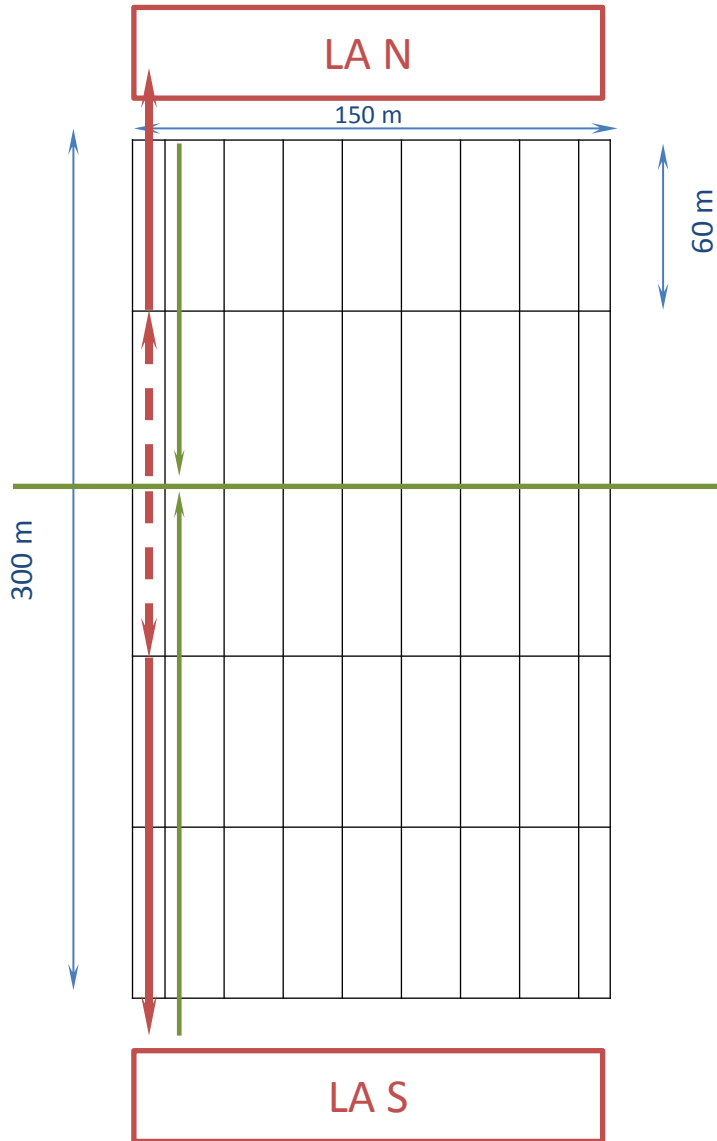


SCENARIO 3

2LA-FD4

- when four assortments: a1, a2, a3 and a4 were extracted, each amounting to 25% of the total harvested timber (THT),
- one load = 120 m
- 2 LA: N & S

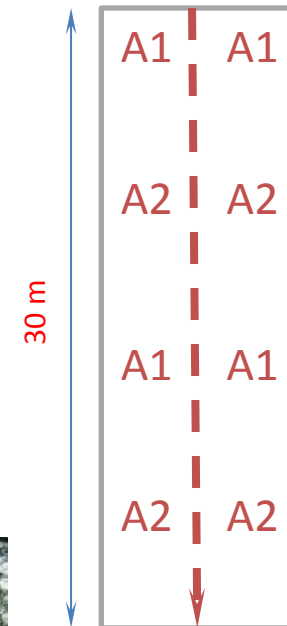




SCENARIO 4

2LA-FD2

- when two assortments: A1 and A2 were extracted, each amounting to 50% of the total harvested timber (THT),
- one load = 60 m
- 2 LA: N & S



Results, Scenarios 1 & 2

1LA-FD4	SR 1	all SRs per 4,5 ha	
300	600	660	
180	360	420	
60	120	180	
	1260	8	
	2520	m	20160
	difference	km	3.36
		%	20
	fuel	€	13.48
	salary	€	65
	total loss	€	78.48
	per m ³	€	0.19



ca 4 l/km (of all forwarding cycles)
1 extra shift
monthly € 1 500

1LA-FD2	SR 1	all SRs per 4,5 ha	
300	600	660	
240	480	540	
180	360	420	
120	240	300	
60	120	180	8
	2100m		16800

Results, Scenarios 3 & 4

2LA-FD2	N 120	SR 1	all SRs per 4,5 ha		2LA-FD2	S 180	SR 1	all SRs per 4,5 ha	
120	240	300			120	240	300		
60	120	180	8				300	8	
		480	m	3840			600m		4800
	S 180	SR 1	all SRs per 4,5 ha			S 180	SR 1	all SRs per 4,5 ha	
180	360	420			180	360	420		
120	240	300			60	120	180		
60	120	180	8				600	8	
		900	m	7200			1200m		9600
				11040					14400
	difference	(S3-S1)	km	-5.76		difference	(S4-S2)	km	-5.76
			%	-34				%	-29
		total					total		
		savings	€	45.71			savings	€	45.71
		per m ³	€	0.11			per m ³	€	0.11

ca 4 l/km (of all forwarding cycles)

0.5 shift less

monthly € 1 500

20 000 m³ a year = € 2 200 savings a year



Uniwersytet Przyrodniczy w Poznaniu

- 1) Lower forwarding costs are possible in thinnings when limited number of assortments are prepared, preferably two;
- 2) Partition of a plot shortens forwarding distance and should be applied in forwarding when access to the stand is possible.

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