Mallee harvesting

Do we need a new type of harvester?

Why?

Plantation harvesting

- With mallees, we must achieve lower costs per tonne than conventional plantation supply chains.
- Large trees with good log form.
- High yields per hectare at harvest.
- Residues are left in the plantation; costs apply to the wood.

Mallee harvesting

- Small trees that do not stack well.
- Relatively low yields per hectare at harvest.
- Relatively low value biomass, partly because the residues are not separated in the plantation.
- Stumpage ($/tonne) comparable to conventional plantations.
- Small margin for the supply chain.

Mallee harvesting

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- Relatively low yields per hectare at harvest.
- Relatively low value biomass, partly because the residues are not separated in the plantation.
- Small margin for the supply chain.
- Because the mallees are small and readily accessible, it is possible process them continuously, directly into bulk chip, and do so at high flow rates.

A commercial bluegum supply chain

Harvest debark delimb stack	Collect & forward	Unload & stock-pile	Load trucks from stock-pile	Road trans-port	Unload at chipper stock-pile	Stock-pile to chipper	Feed chipper	Stock-pile chip	Load chip trucks	Road trans-port	Unload chip trucks

A commercial bluegum supply chain - knuckle-boom cranes

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A commercial bluegum supply chain - and loaders

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A commercial bluegum supply chain – cranes, loaders and putting wood on the ground

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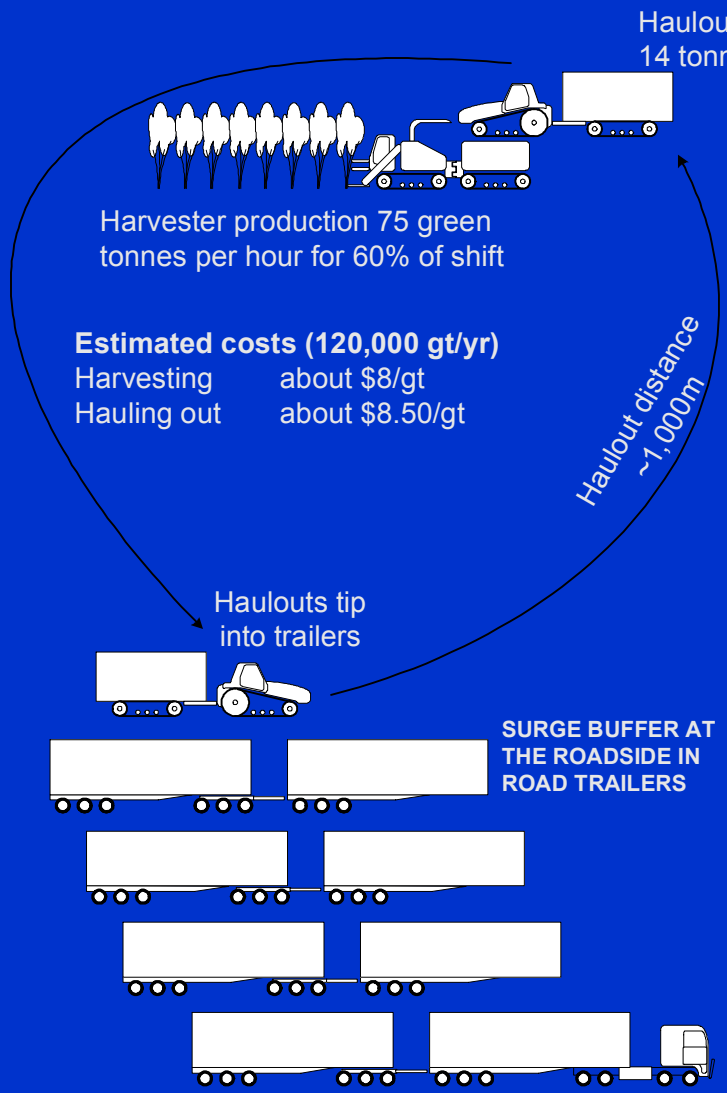
Proposed mallee supply chain copied from sugar cane

Harvest chip & load haulouts	Haul to roadside	Unload directly into road trailers	Road trans-port	Unload by side tipping

PROPOSED MALLEE BIOMASS SUPPLY CHAIN BASED UPON SUGAR CANE SYSTEMS



PROPOSED MALLEE BIOMASS SUPPLY CHAIN BASED UPON SUGAR CANE SYSTEMS

Haulout capacity
14 tonnes.

Harvester production 75 green tonnes per hour for 60% of shift

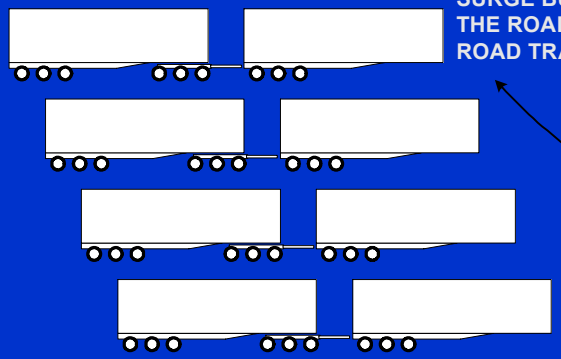
Estimated costs (120,000 gt/yr)

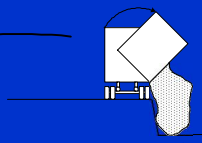
Harvesting	about $8/gt
Hauling out	about $8.50/gt

Haulout distance ~1,000m

Haulouts tip into trailers

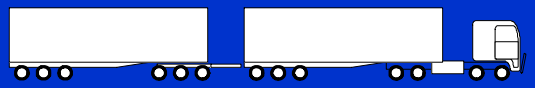
SURGE BUFFER AT THE ROADSIDE IN ROAD TRAILERS





FACTORY
Biomass delivered into a pit by side-tipping trailers.

Road transport by one or two prime movers, depending upon the transport distance.



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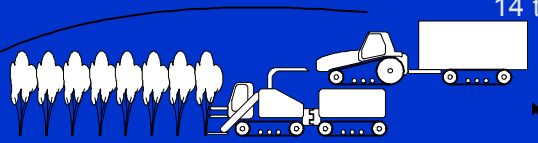

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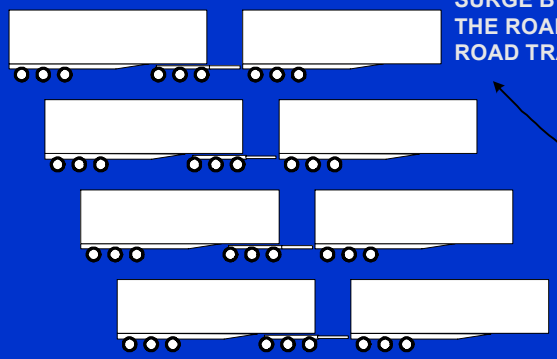

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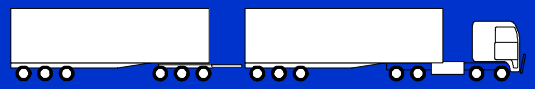

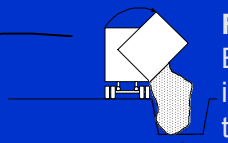

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Biomass delivered into a pit by side-tipping trailers.

SCALE OF PRODUCTION

One harvester working 50 shift hours a week
- 450 green tonnes per day
- 110,000 - 120,000 green tonnes per year

One harvester working 120 shift hours a week
- 1,100 green tonnes per day
- 250,000 green tonnes per year
- Cost per tonne reduced by about 10%

Where to from here?

- Existing prototype – development of concepts, and approaching the end of life.
- In 2001, estimate of ~$3 million and 3 years to develop a production design (Woodside project).
- Now perhaps a $5 million and 3 year project.
- Limited capacity to recover cost of R&D.
- FFI CRC - assemble those who need the biomass and seek substantial government support.