Mechanised harvesting of short-rotation coppice

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cost
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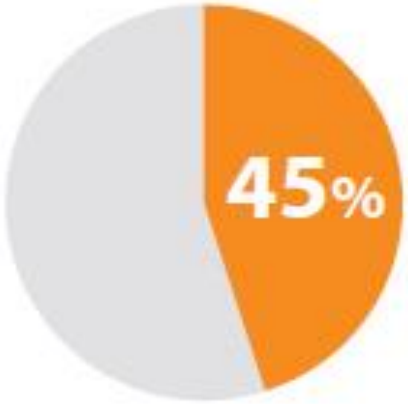
Harvesting of short-rotation coppices



of the cultivation cost

2nd

largest input of fossil fuel

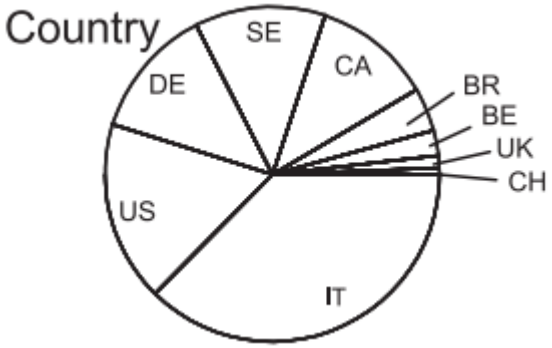
1/3

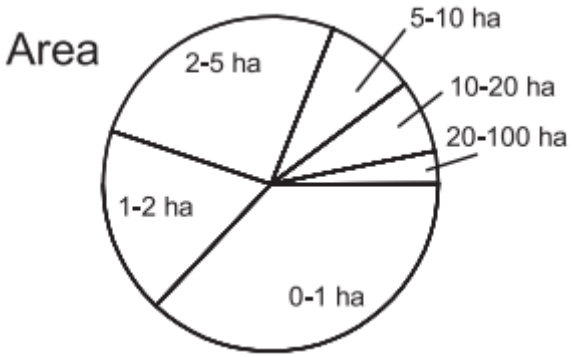
of the energy input

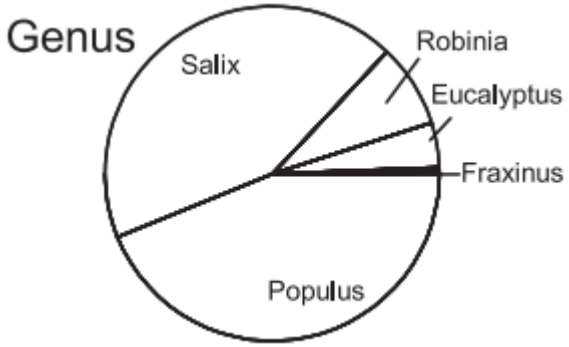
Harvesting techniques

- Single pass
  - Cut-and-chip
    - Modified forage harvester
    - Mower-chipper
  - Cut-and-bale
  - Cut-and-billet
- Double pass — Cut-and-store — Whip harvester

166 field trials



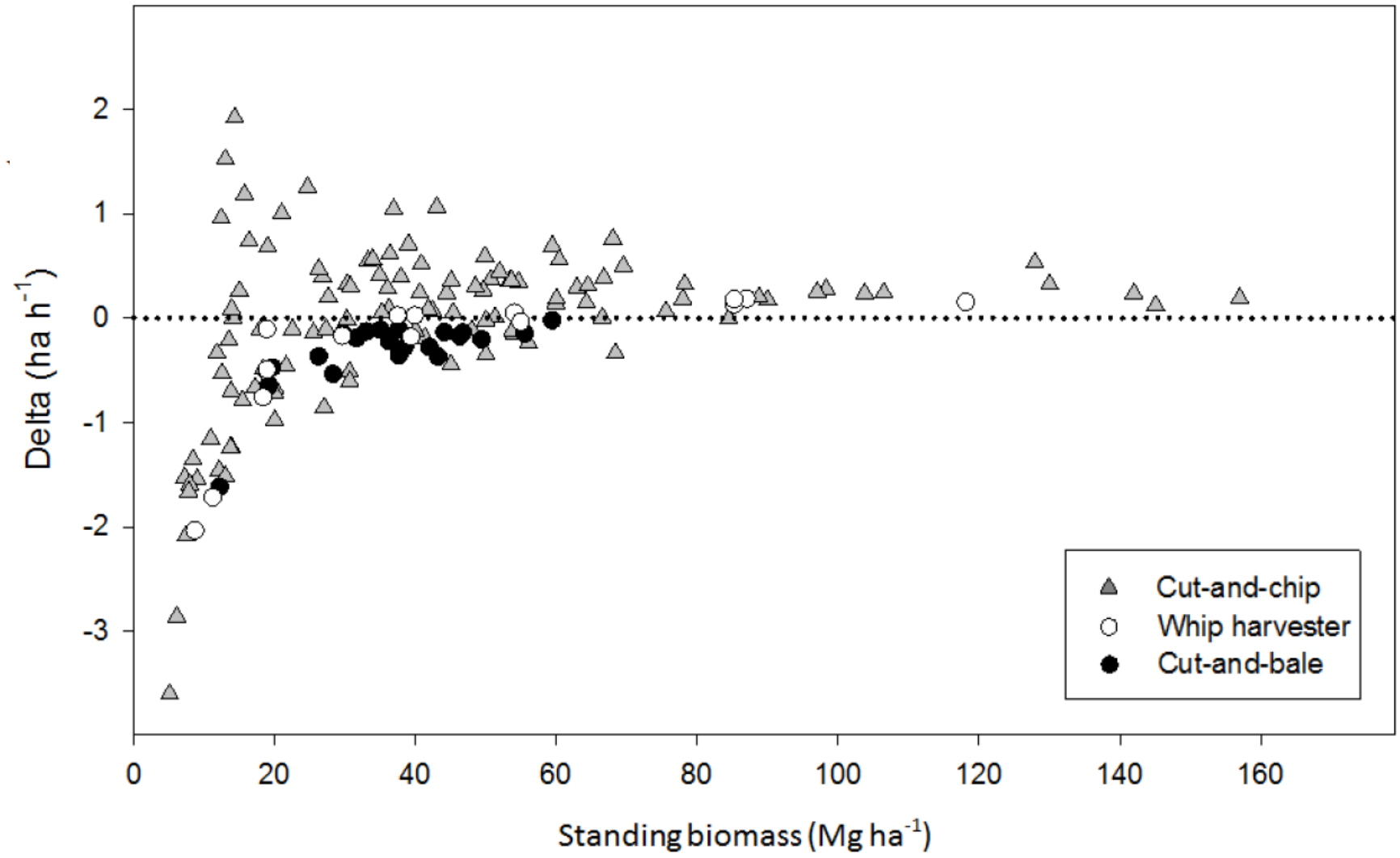




166 field trials

		Mean	St dev	Min	Max
Planting density (stools ha^{-1})	Cut-and-bale	14 807	4 377	1 666	16 667
	Cut-and-chip	8 978	3 555	1 600	17 544
	Cut-and-store	11 117	5 468	5 000	25 600
Shoot age (y)	Cut-and-bale	2.3	0.6	1.5	3.0
	Cut-and-chip	2.8	1.2	1.0	6.0
	Cut-and-store	2.6	0.7	2.0	4.0
Field stocking (Mg ha^{-1})	Cut-and-bale	36.7	11.9	12.2	59.4
	Cut-and-chip	44.0	31.2	5.1	157.0
	Cut-and-store	45.4	32.8	8.7	118.1

Harvester productivity



Harvester productivity

Maximum engine power

		Mean	St dev	Min	Max
Effective material capacity (Mg h^{-1})	Cut-and-bale	13.8	4.7	3.3	21.8
	Cut-and-chip	30.0	18.0	1.2	90.6
	Cut-and-store	19.2	13.1	1.9	41.3
Maximum engine power (kW)	Cut-and-bale	144	5	140	160
	Cut-and-chip	342	123	100	606
	Cut-and-store	119	29	80	150

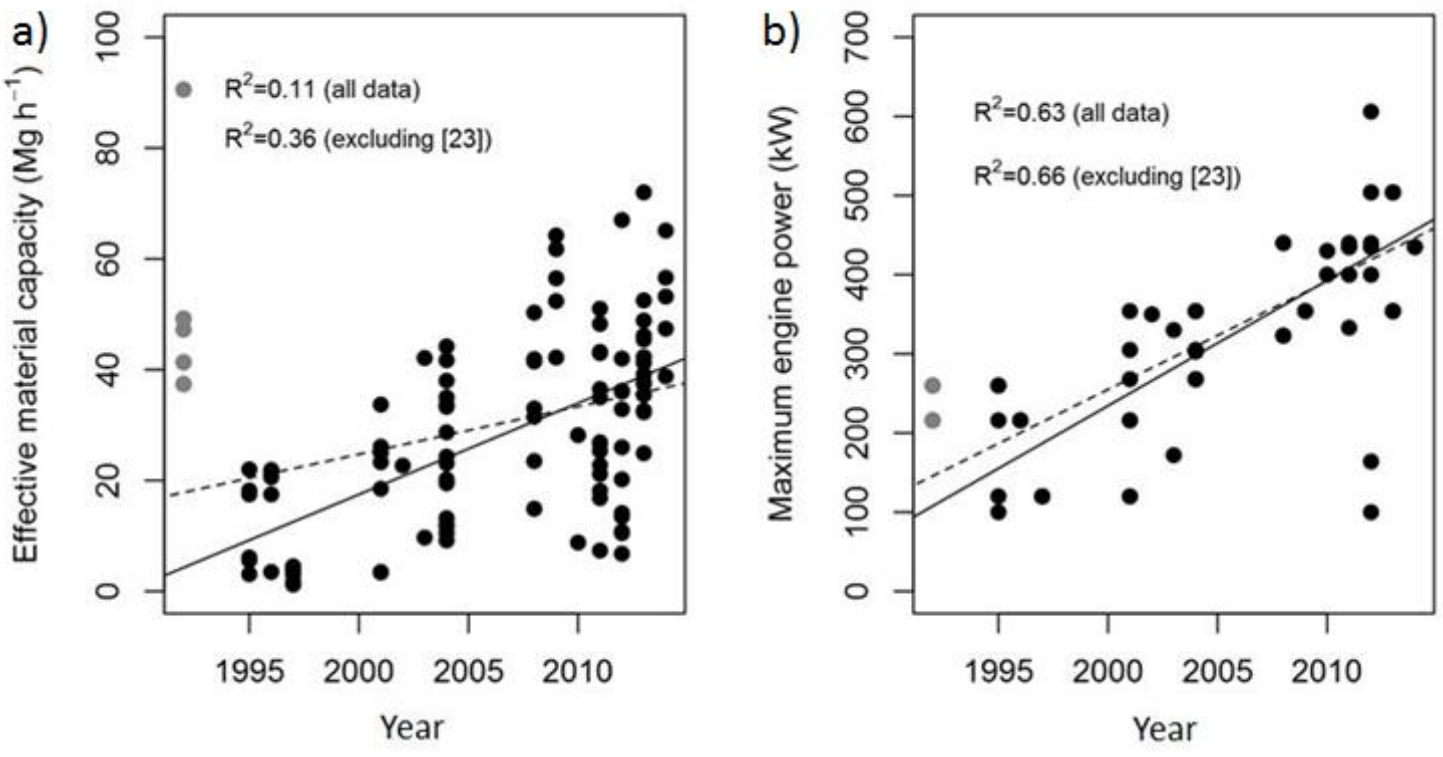
Harvester productivity

Maximum engine power

		Mean	St dev	Min	Max
Planting density (stools ha^{-1})	Cut-and-chip (all)	8 978	3 555	1 600	17 544
	Cut-and-chip (< 200 kW)	5 624	1 704	3 470	8 000
Shoot age (y)	Cut-and-chip (all)	2.8	1.2	1.0	6.0
	Cut-and-chip (< 200 kW)	2.7	0.7	2.0	4.0
Field stocking (Mg ha^{-1})	Cut-and-chip (all)	44.0	31.2	5.1	157.0
	Cut-and-chip (< 200 kW)	18.4	13.2	5.1	50.0

		Mean	St dev	Min	Max
Maximum engine power (kW)	Cut-and-bale	144	5	140	160
	Cut-and-chip (all)	342	123	100	606
	Cut-and-chip (< 200 kW)	124	19	100	172
	Cut-and-store	119	29	80	150
Effective material capacity (Mg h^{-1})	Cut-and-bale	13.8	4.7	3.3	21.8
	Cut-and-chip (all)	30.0	18.0	1.2	90.6
	Cut-and-chip (< 200 kW)	4.6	2.7	1.2	10.8
	Cut-and-store	19.2	13.1	1.9	41.3

Harvester evolution



Conclusions

- Field stocking influences speed and productivity of harvesting
- Cut-and-chip harvesters dominate the market
  - More productive
  - More powerful
  - More technological development
- If equally powerful
  - Cut-and-chip harvesters least productive

U bent uitgenodigd op de openbare verdediging van het proefschrift met titel

You are cordially invited to the public defence of the PhD dissertation entitled

Fysiologie en productiviteit van korte-omloop hakhout: genotypische verschillen en impact van de oogst

Physiology and productivity of short-rotation coppice: genotypic differences and impacts of harvesting

door *by*

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The thesis will be defended on Friday 30 June 2017 at 10 a.m.

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