Role of CTF in low input ecological systems

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CTF Europe

Most of what we recognise as poor soil structure is caused by field traffic

What is a “good” soil structure?

- A diverse mix of solids, air and water with a continuous network of pores that allow free movement of air, water, roots & soil fauna

Example of good soil structure & poor soil structure caused by field traffic

Good

Poor

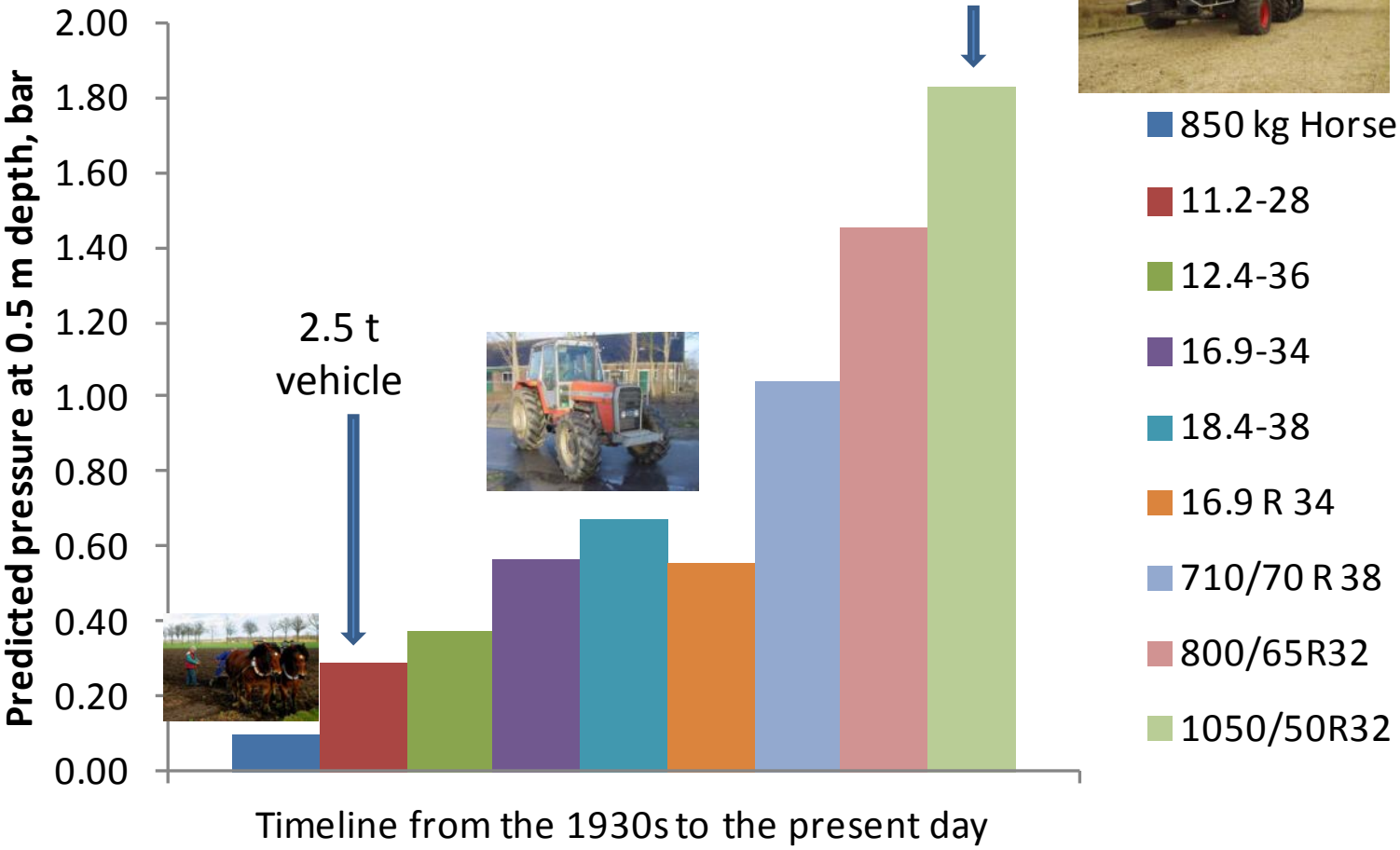
Evidence of damage in arable crops

Creation of damage in grassland

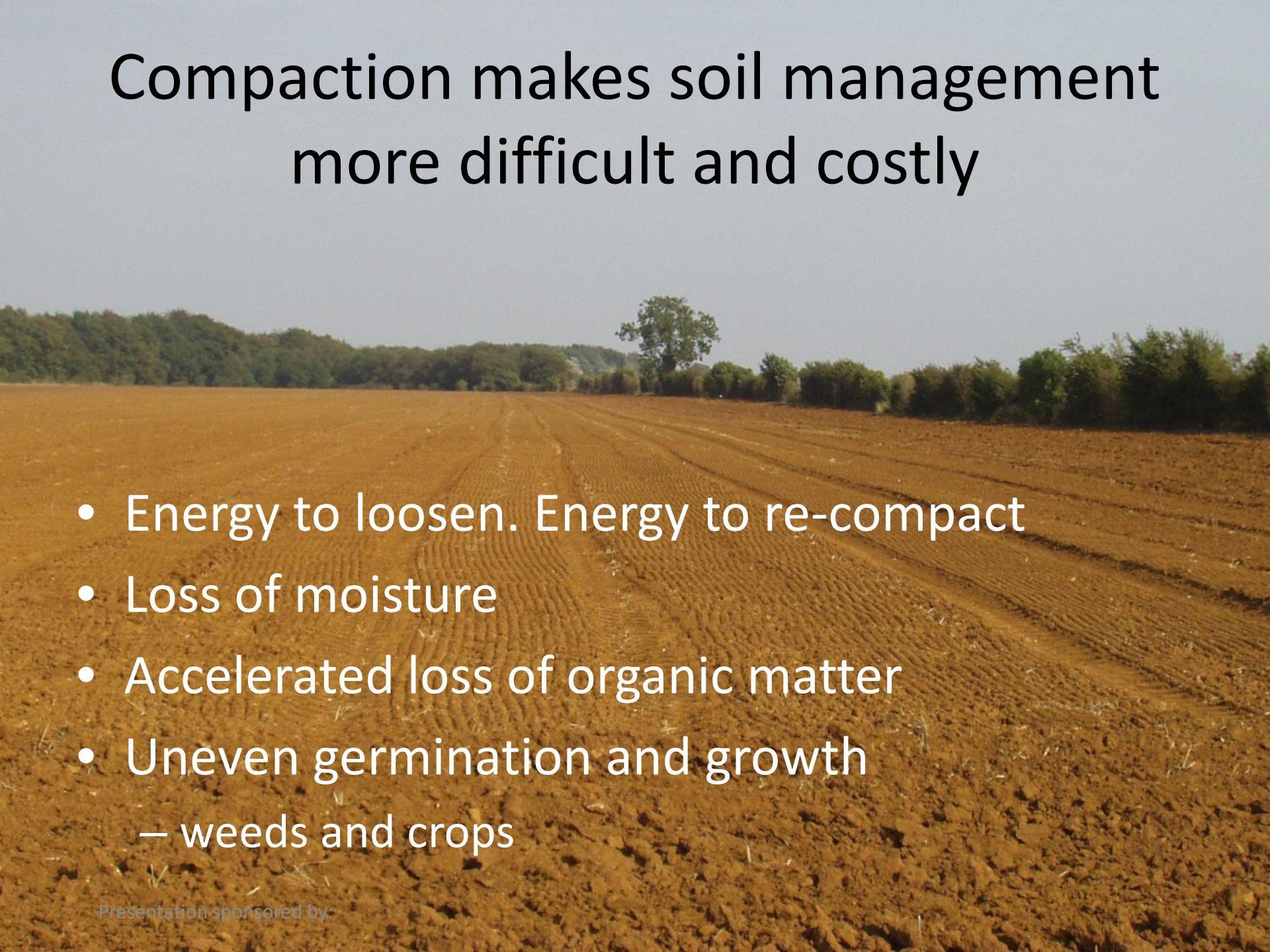
Same field, one week later!

Heavier machines increase threat to subsoils

It's load that does damage at depth!



Compaction makes soil management more difficult and costly



- Energy to loosen. Energy to re-compact
- Loss of moisture
- Accelerated loss of organic matter
- Uneven germination and growth
  - weeds and crops

Controlled Traffic Farming

- any system that confines all tracks to least possible area of permanent traffic lanes
  - CTF is NOT prescriptive about tillage
  - CTF is NOT just about keeping tramlines in the same place
  - CTF is a commitment to continual improvement

CTF – how?

- Match as many track gauges as possible

- Match implement <u>operating</u> widths

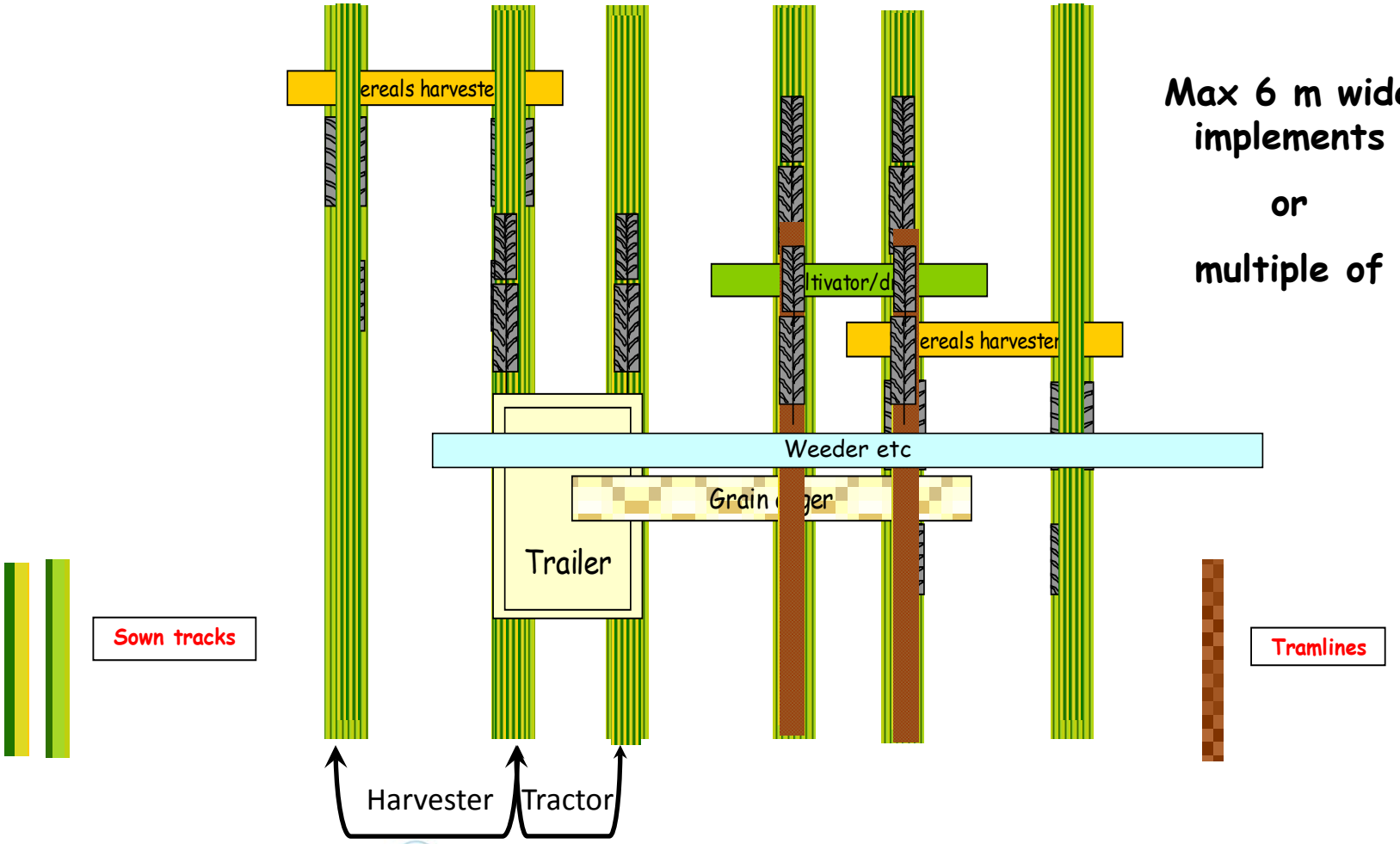
- Introduce a Global Navigation Satellite System (GNSS) with RTK correction

Base station

Rover

Matching widths

TwinTrac – tractors straddle harvester passes

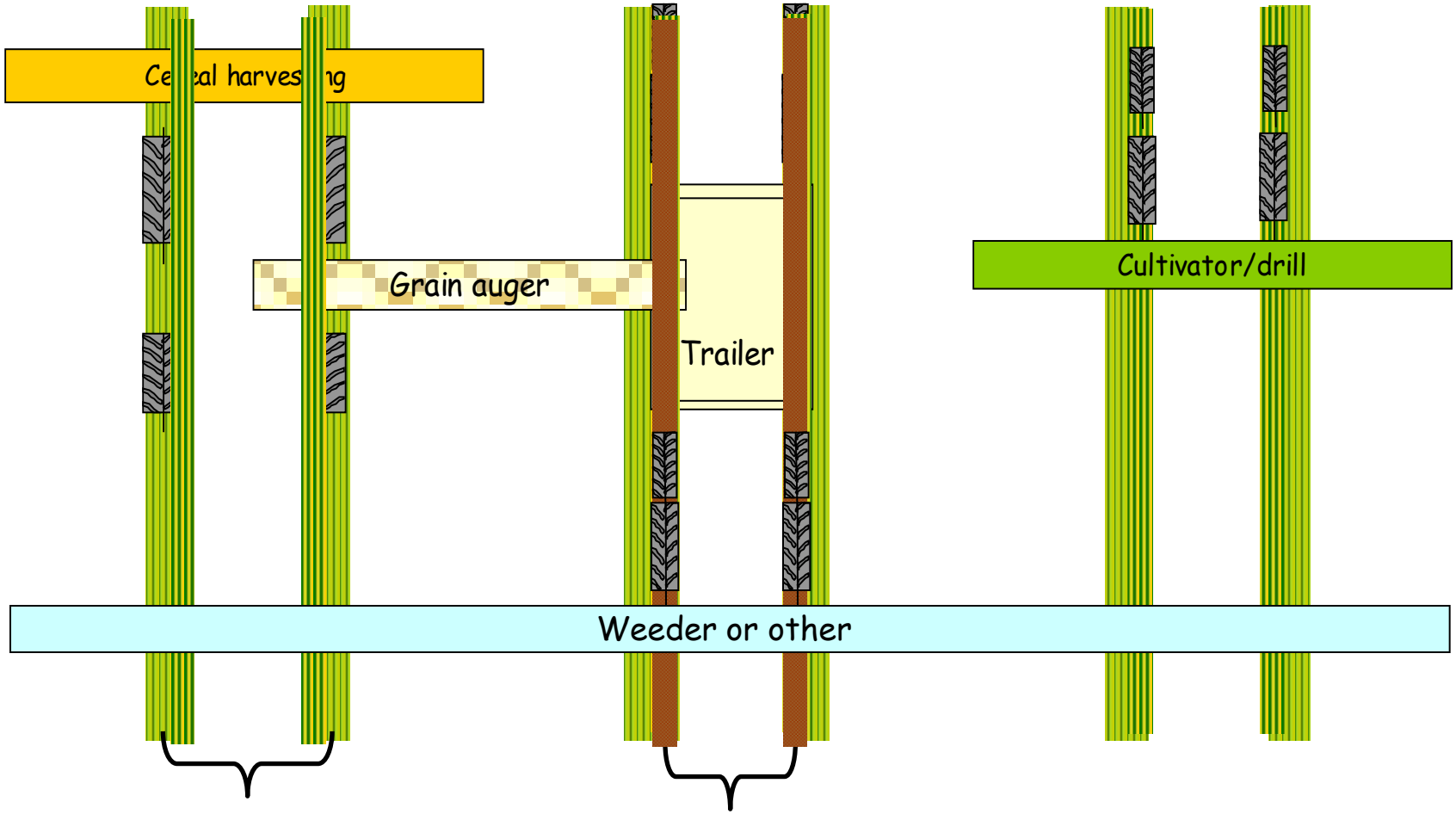


Max 6 m wide implements

or

multiple of

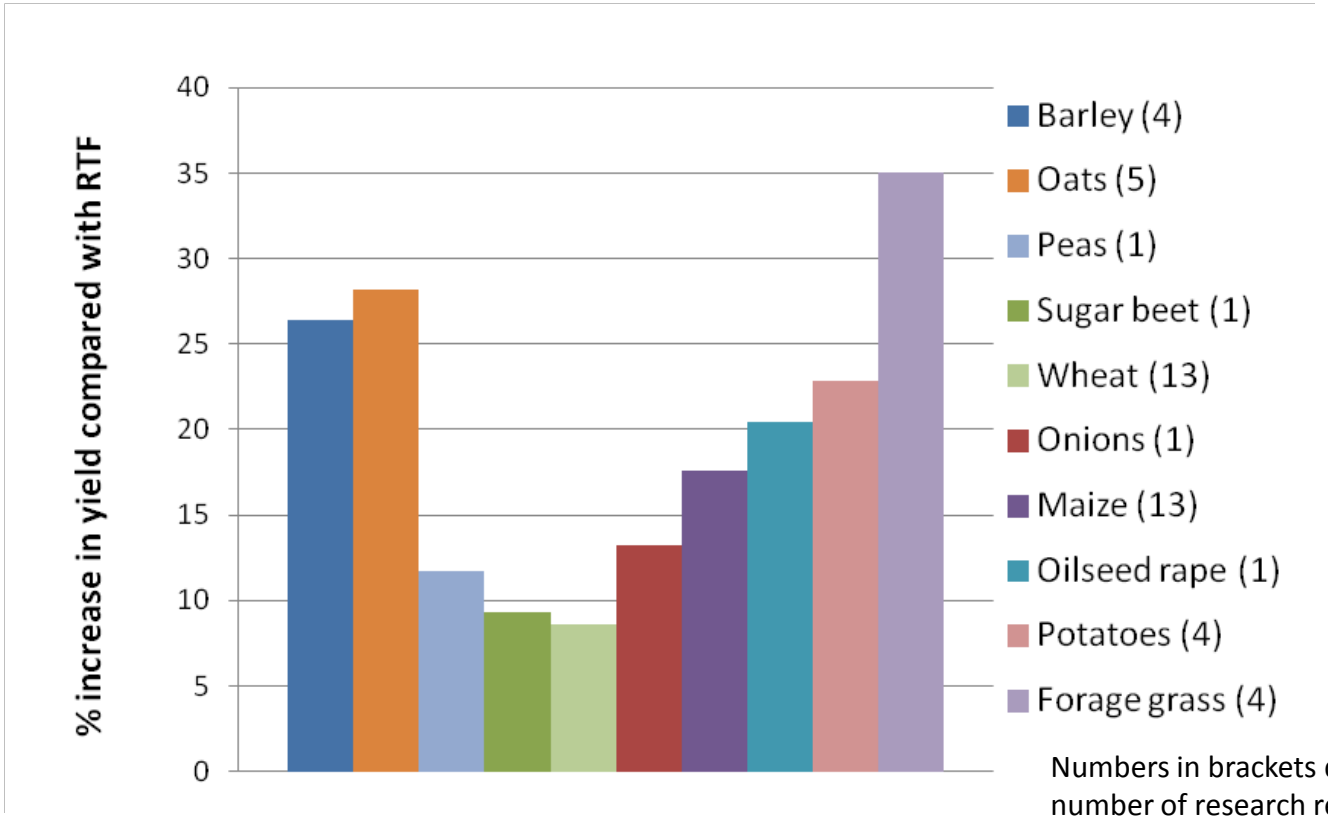
Matching track and implement gauges
"OutTrac" CTF system



BENEFITS OF CTF

Yield improvements with CTF

% increase in yield by crop type under controlled compared with random traffic



Numbers in brackets denote number of research results from which data were taken

Benefits of CTF

Some of the advantages

- Soils stay drier at the surface
- Spring sowing a lot easier (traffic lanes)
- Soil more amenable to inter-row tillage
- Stale seedbeds easier to create
- Later drilling less risky because of permanent traffic lanes

On-farm costs

East Hendred

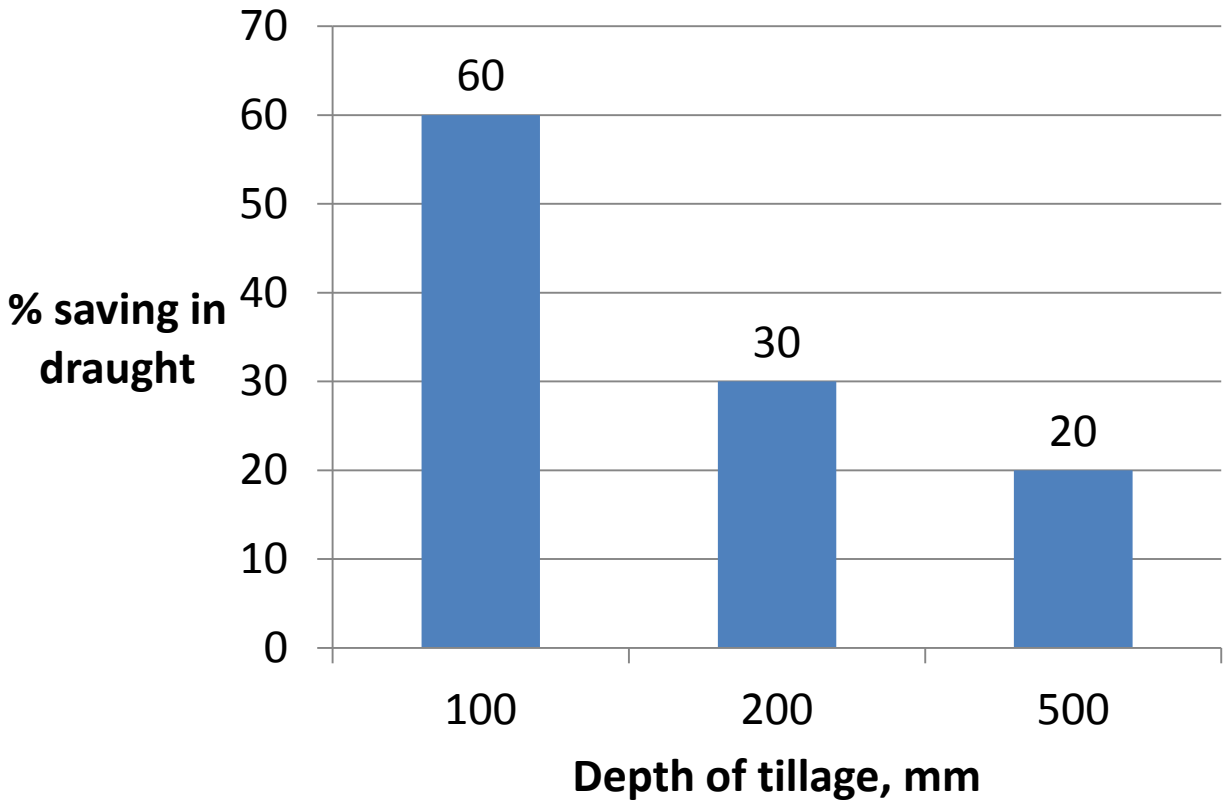
Old System

	Hrs/Ha	L/Ha
V-Form	0.36	15
Triple Press	0.25	9.38
Camb Roll	0.17	2
6M Drill	0.26	9.74
Camb roll	0.17	2
	1.21 Hrs/Ha	**38.12 L/Ha**

CTF System

	Hrs/Ha	L/Ha
Subsoil CTF Lanes	0.22	5
10m Cult	0.15	6.8
Camb Roll	0.17	2
10M Drill	0.17	7.48
Camb roll	0.17	2
	0.86 Hrs/Ha	**23.28 L/Ha**

Reductions in tillage draught with no traffic



Effects of tracking on infiltration

CTF > by average factor of 4

No obvious wheel track in stubble
375 mm/h infiltration

Wheel track evident in stubble
No measurable infiltration

Poor infiltration leads to water, nutrient and soil loss

CTF in potatoes and onions

The ultimate goal!
Planting all crops with surface or no tillage, as here, straight from onions into potatoes

Next generation CTF?