Controlled Traffic Farming

Why and How

Tim Chamen, CTF Europe
The underlying problem!

Timeline from the 1930s to the present day

Predicted pressure at 0.5 m depth, bar

850 kg Horse
11.2-28
12.4-36
16.9-34
18.4-38
16.9 R 34
710/70 R 38
800/65R32
1050/50R32

2.5 t vehicle
21 t vehicle

6 fold increase
Tracking is extensive every year

- Rake, disc x2, drill, roll, harvest
- 127% tracking
And it’s not just cultivated soils!
Wheels have a big impact!

• Same field one week later!
Yorkshire
Definition of CTF

– a 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
BENEFITS OF CTF
Consistently higher crop yields

% 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
Lower costs

• Cuts
  – fuel use by 35%

• Uses fertilizer more efficiently
  • 15% better N recovery

The more you run on it!
the more fuel and time you waste!
the more fuel and time you waste!
What does CTF deliver?

- Lower machinery costs
  - less power per unit width
  - less “aggressive” cultivators
  - shallower tillage
  - better stale seedbeds
  - smaller tractors
  - maximum potential for no till
RTF compared with CTF

both fields in no-till for 3 years - neither deep loosened
Environmental benefits of CTF

• 4 x better water infiltration
  – less run-off and erosion
    • reduced pollution of water courses
  – more plant available water
Non-trafficked soil after potatoes & heavy rain (Tasmania)
Randomly trafficked soil after potatoes & heavy rain (Tasmania)
Environmental benefits of CTF

• Reduced nitrous oxide emissions
  – consequential loss of N

• Earthworm numbers increased due to less soil compaction and tillage
Summary of water benefits

- Drainage CTF + 100%
- Plant water CTF + 34%
- Infiltration CTF + 400%
CTF - how?

TwinTrac – tractors straddle harvester passes

Max 6 m wide implements
Implement width = Track 1 + Track 2
TwinTrac in practice

Implement width = Harvester track width + Tractor track width
Andrew Manfield, UK
200 ha Hessleskew

- CTF a way of thinking
- 50% less fuel with CTF & No-till
  - 5 tractors down to 3.5
  - No no-till without CTF
    - still some cults
    - ploughing 2 gears up on CTF
- Potatoes fit into system
  - 1.93 and 3.86 m track gauges
CTF - how?

OutTrac – two track gauges

Cereal harvesting

Grain auger

Trailer

Chemical application

Harvester e.g. 2.8 m

Other vehicles e.g. 2 m

Cultivator/drill
OutTrac in practice
Matching implement widths
Match auger length
Repeatability needs RTK

GNSS satellites e.g. GPS, GLONASS

Geo-stationary satellite

EPHEMERISERRORS

RTK

Base

Network centres
Proof of RTK accuracy and repeatable positioning

9 m auto-steer with 9.14 m cutting platform
Giving it a try

• Measure up your machines – don’t believe what you are told!
  – track gauges and any adjustments available
  – tyre sizes
  – implement actual working widths

• Test a system
  – in one or two fields
  – know where you’ve run and where you haven’t
Test example:
Machinery as found at Compton Beauchamp Estates

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<td>66.30%</td>
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Data Tracked Uncropped
Percentage 66.30% 3.31%

<2  2-3  4-5  6-7  >7
Compton Beauchamp – small changes
Machines auto-steered on 6, 12 and 36 m

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- results in first season

0 post harvest | 2 post harvest | 3 post harvest
Challenges

• How to manage cropped traffic lanes
  – leave alone?
  – shallow cultivate?
  – deep loosen?

• How to manage non-trafficked soil
  – never had it before
  – which soils might need regular cultivation and to what depth?
  – do we ever need to cultivate beyond disturbance created by drill?
CTF Europe membership

• Join the growing number who are:
  • Sharing ideas
  • Visiting other farms
  • Attending “in-house” workshops

• £96 one off fee in UK

Sign up at:
www.ctfeurope.eu