

# **CTF: better for the environment (and farm income)**

*Examples from Australian Grain Production*

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CTF 2015, Prague, [CTF Europe.eu](http://CTFEurope.eu)

# **Australian (v. European) Grain**

**Most production in semi-arid areas.**

**Low cost systems; often low yields.**

**Large farms, minimum labour, large equipment**



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18m Header: [Midwest.com.au](http://Midwest.com.au)

# Australian (v. European) Grain

Most production in semi-arid areas

Yield is water-limited. Rain is scarce, *but*



*Occasional  
high-intensity\*  
storms cause  
Disastrous  
Soil erosion.*

CTF 2015, Prague, CTF Europe *\* >100mm/h*

**CTF: A way to reduce fuel use?**

**CTF: A better system of Conservation Agriculture**

- **Permanent crop zones**  
managed for optimal soil/crop performance *and*
- **Permanent traffic zones (<15% area)**  
managed for optimum machine performance.

## **Requirements**

- **All heavy wheels precisely on permanent traffic lanes.**
- **Traffic lane layouts designed for optimum drainage and logistics.**

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**10 - 25% of Australian Grain Production**

# Energy effects of CTF

Non-wheeled CTF soil is easier to till and plant.

*Less fuel used for tillage and planting (25-50%)*

Less rolling resistance on hard permanent traffic lanes

*Less fuel for spraying ( $\frac{1}{2}$ -1 l/ha), harvesting (2-3 l/ha)*

Impact:

## Fuel Use

>50 l/ha Tillage-systems

~25 l/ha No-Till systems

<15 l/ha Precision CTF

CTF 2015, Prague, [CTF.Europe.eu](http://CTF.Europe.eu)

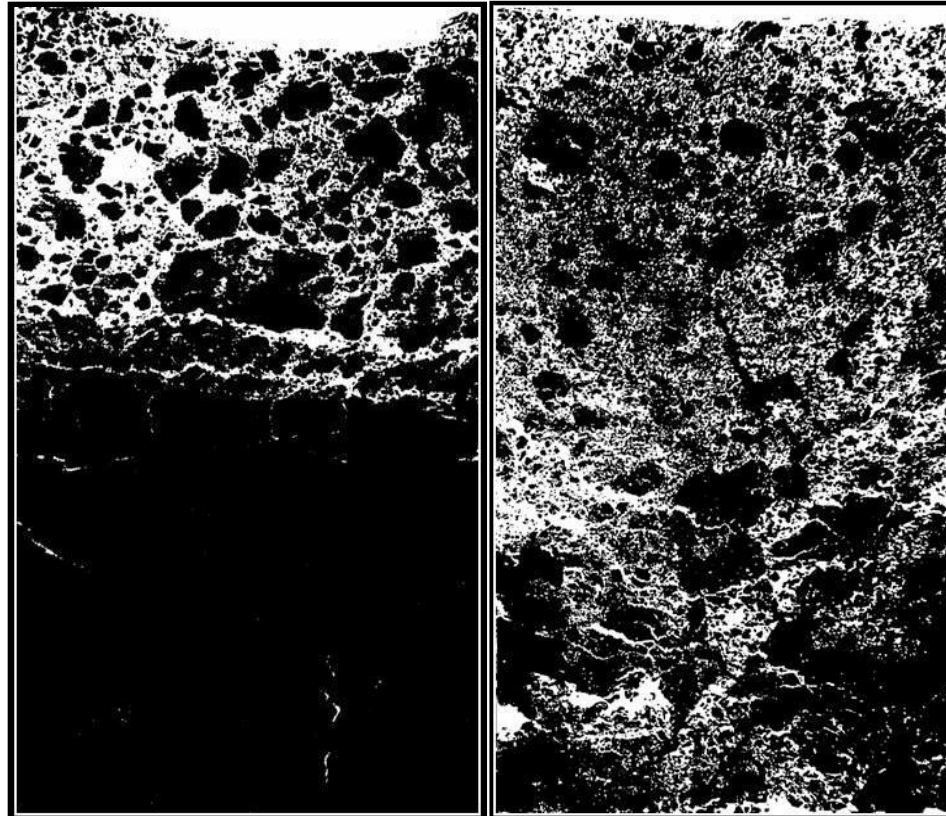
*Soil impact is greater*

# CTF Impact on Soil : Profile Images

Heavy clay vertosol after 4 years no-till grain production

Black = Soil Solids,  
White = Pore Space

Annually  
Wheeled  
(5t Tractor)



Non-Wheeled  
(4- Year CTF)

24 cm

Porosity to  
depth from  
roots, biota,  
shrink/swell

Min. Porosity,  
Aeration,  
Infiltration  
& Soil life

(Des McGarry)

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*Soil Porosity: large environmental & economic impacts*

# **Environmental Impact- CTF Soil**

**15-50% less runoff in many conditions**

**Less loss of Soil, Nutrients, Pesticides.**

**Less Waterway Pollution (N & P)**

***N. American Great Lakes***

***Australian Great Barrier Reef***

**CTF 2015, Prague, CTF Europe.eu**

# Environmental Impact- CTF Soil

**15-50% less runoff in many conditions**

**Better internal drainage.**

**Less time Near-Waterlogged–**

**Less loss of Nitrogen as gas (denitrification).**

**$N_2O$  emissions from Wheeled soil = 5 x bed emissions**

**Overall CTF effect on  $N_2O$  e.g. = 1kg  $N_2O$ /ha.year**

***(powerful greenhouse effect)* = 300kg  $CO_2e$ /ha.year**

**$N_2O$  is only 2-5% of total N loss**

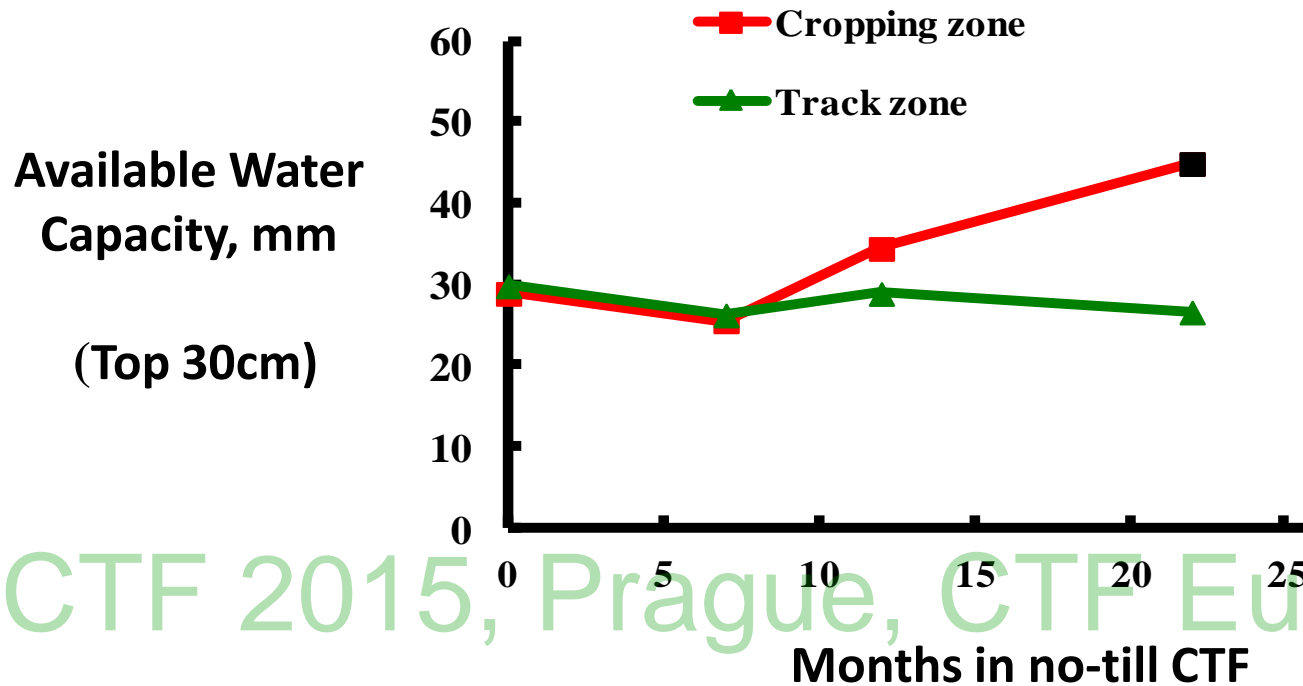
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# Economic Impact - CTF Soil

**More Available Water: 20- 40% effects**

**Greater yields (10-15%)**



# Economic Impact -CTF Soil

**More Available Water: 20- 40% effects**

**Greater yields (10-15%)**

**Less time Near-Waterlogged**

**= Less N loss in: Denitrification (30 x N<sub>2</sub>O)**

**Runoff & Leaching**

**CTF Grower statements: 15-30% less N, P**

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# **CTF *System*: often the Greatest Impact**

**More Timely Operation + More Available Water**

**= More or better crop yields + biomass**

**= More soil protection + potential Carbon**

**Greater Precision + Timeliness**

**= New residue & weed options**

**e.g. Interrow seeding, spraying.**

**Excellent fit with no-till**

***All good for the Environment, and Farm Incomes***

# One example: Harvesting sooner after rain *and a Planting Opportunity*



Minimum opportunity for weeds and moisture loss  
***CTF: A better system of Conservation Agriculture***  
CTF 2015, Prague, CTF Europe.eu  
Reference material in many publications. [www.actfa.net](http://www.actfa.net)

**Different Environments = Different Opportunities**

*.....but many of the same principles will apply*



**Thank You**

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