

# **Economics assessment of CTF**

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

# Personal presentation

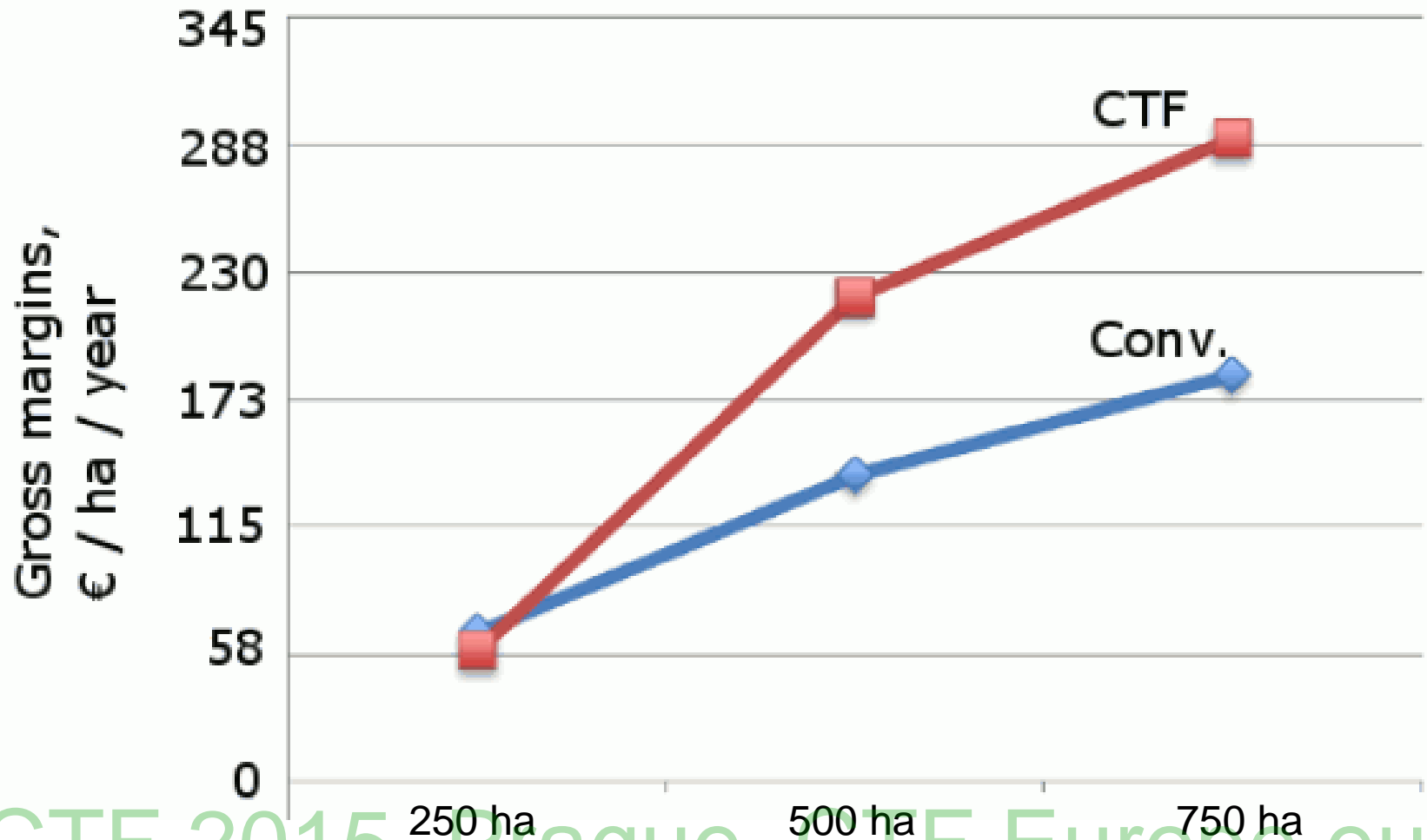
- MSc in Agriculture -Economics & Management
- Specialized in CTF and Precision Agriculture

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# Outline

- CTF in arable crop rotations
- CTF in forage grass
- How to calculate and predict the economic outcome of CTF on farm level

# CTF in arable crop rotations



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# The model for arable crops

- Reduced tillage (RTF) and CTF
- 250 ha, 500 ha & 750 ha
- 6-, 8-, 9-meter CTF modules
- Crop rotation: 50% W-Wheat, 25% Barley & 25% Oil seed rape
- Fuel savings, timeliness costs & input saving from the use of RTK auto steer
- Yield increase

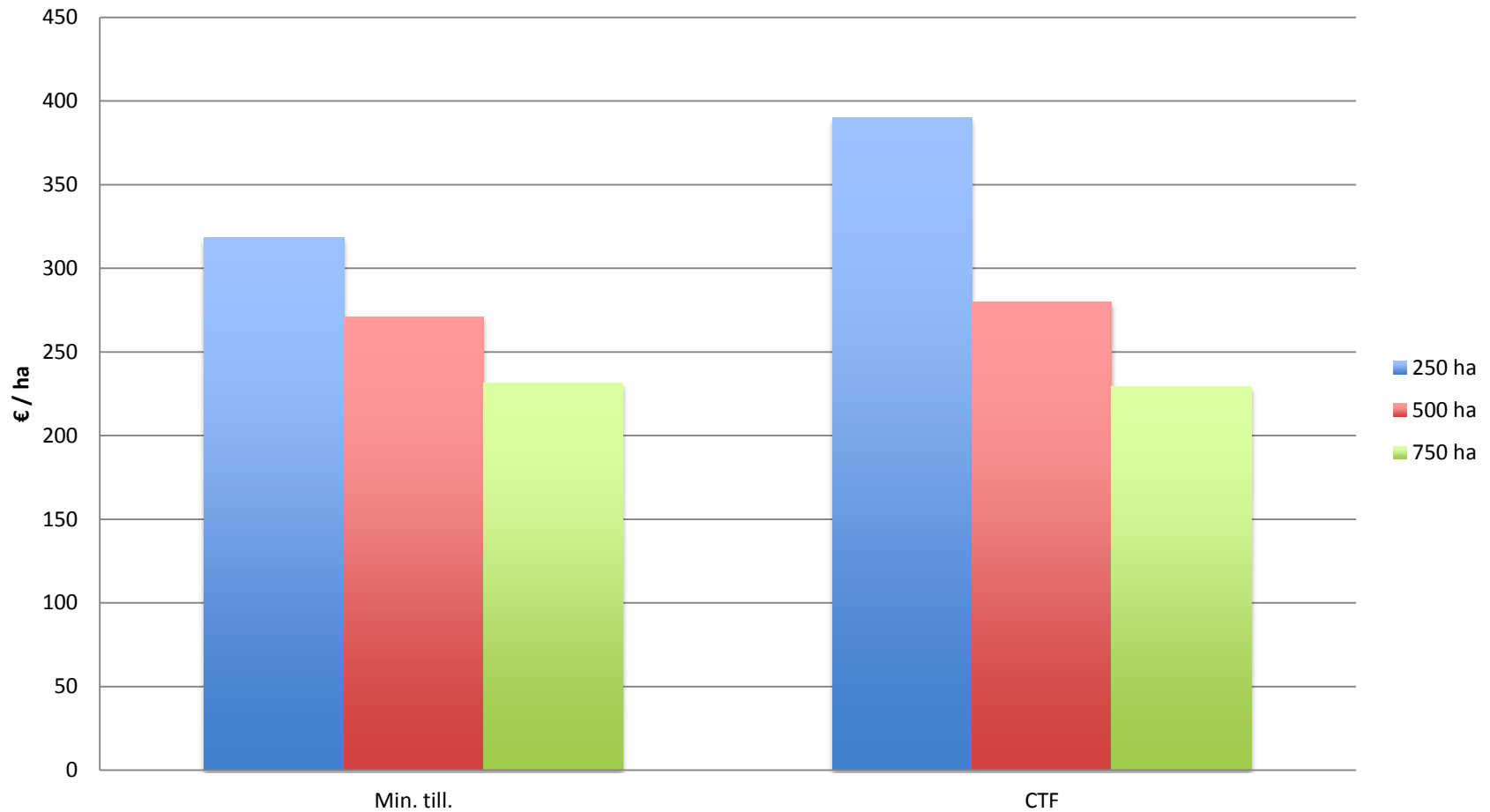
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# Yields in the calculations

- 17 % increase in non-trafficked areas
- 16% reduction in traffic lanes
- Basic geometry

Yield outcome CTF				
	Conv.	6-M CTF	8-M CTF	9-M CTF
<b>W-Wheat</b>	7300 kg/ha	7418 kg/ha	7586 kg/ha	7686 kg/ha
<b>Barley</b>	5500 kg/ha	5633 kg/ha	5715 kg/ha	5791 kg/ha
<b>OSR</b>	4100 kg/ha	4166 kg/ha	4260 kg/ha	4317 kg/ha

# Machinery costs



\* 5 % interest rate, Prague, CTF Europe.eu

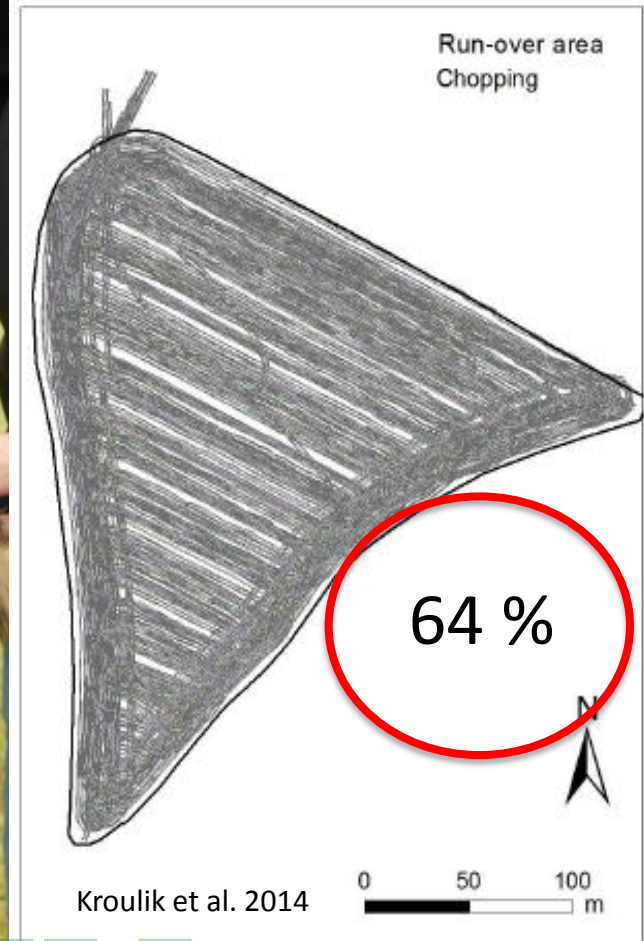
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# Results & conclusions

- CTF is profitable in arable rotations, but...
- Machinery costs are decisive for smaller farms
- This study may use oversized tractors



# CTF in forage grass



# Case farm - Dairy

- 300 cows, 300 hectare, approximately 50% grass leys, arable rotation
- 12-meter CTF system for grass harvest and slurry
- 12 % yield increase
- Adjusted feed rations, increase silage quality

# Results & Conclusions

- Increasing profits, 50 € / cow /year
- 1 cent (€) cost reduction per kg milk produced
- 2.0% yield increase for break even

Yield response				
Study	Yield depression	Crop	Soil type	Location
Douglas & Crawford, 1991	32%	Ryegrass	Clay loam	Scotland
Douglas et al., 1992	13%	Ryegrass	Clay loam	Scotland
Elonen, 1986	8-68%	-	Clay loam	Finland
Frame, 1982	11-36 %	Red clover	-	Scotland
Frost, 1988	9-13%	Ryegrass	Clay loam - sandy clay loam	Northern Ireland
Hansen, 1996	27%	Grass/clover	Sandy loam	Norway
Håkansson et al., 1990	9%	Grass/clover	Various	Sweden
Jorajuria et al., 1997	74%	Grass/Clover	Silty loam	Argentina
Jørgensen et al., 2009	4,6-23%	Grass/Clover	-	Denmark
Rasmussen & Møller, 1981	21-54%	Ryegrass & Grass/clover	Sandy loam & Silty loam	Denmark

# The model

- Mathematical programming to optimize the farm management for maximum profits
- This may tell us If CTF will increase profits, and if CTF will change the crop rotation.
- Possibility to make sensitivity analysis and estimate break-even point
- Calculate marginal costs for different production units

# How to use the program

- Input: existing machinery system, and proposed CTF system
- This gives fixed and variable machinery costs for the two systems
- Crop rotation restrictions
- Expected differences in production costs & yields for each crop
- Any other technical or biological restrictions

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# What's different from other models?

- Test a various number of combinations to determine the maximum profitability
- It can handle complexities in of some crops, e.g. quality aspects.
- A general model to estimate the profits from CTF on a specific farm

# Future estimation of profits from CTF

- Going into CTF will include some uncertainties
- Previous research from different fields of study may answer some of the questions regarding profits from CTF
- Especially if knowledge from different areas is brought together
- New field trails may increase the accuracy

**Thank you for the attention!**

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