

European Regional Development Fund





Conference "Incentivising carbon farming"

"Improving biomass flow and soil organic carbon in arable farming – approaches and results of two-year trials in the North Sea Region"

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Summary and conclusion

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All Carbon Farming trials



Managements in categories:

- 1. Land use: Agroforestry, grassland
- 2. (External) input: Manure, compost, champost, biogas digestate, wood chips
- 3. Cropping: Cover crops, undersown crops, tillage

Methods of analysis:

SOC and N total - Elementary analysis according to DIN ISO 10694 (1996) Carbonates - Elementary analysis according to VDLUFA, A 4.1.3.2, (2016)

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Material and methods Soil sampling frequency/statistics

	i	i	
Year	Undisturbed ring	Disturbed samples	
	samples in 5-10 cm	in 0-30-60cm	
	(40-45 cm)		
Fall 2018/ Spring	v	v	
2019	^	^	
Fall 2019	x	x	
	~	~	
Fall 2020	x	x	
Fall 2021	x	x	

- Statistics: Software JMP[®] 12.0.1 (Copyright 2015, SAS Institute Inc., Cary, NC, USA)
- Significance analysis with ANOVA, F-test, student t-test,

sig. level p≤ 0.05

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Biomass yields (dry matter) of undersown crops in 2020



Biomass yields [Mg ha-1] in dry matter

Significant higher dry matter biomass yields of undersown crops, p ≤ 0.05

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Results

C_{org}-stock [Mg ha⁻¹] in 30 cm soil depth in 2019 and 2020 in North Germany







C_{org}-stock [Mg ha⁻¹] of topsoil

• No significant differences, $p \le 0.05$

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3N Competence Center of Lower Saxony

C_{org}-stock [Mg ha⁻¹] in 30 cm soil depth in 2020 in Central Germany



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Inagro, Belgium

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C_{org}-stock [Mg ha⁻¹] in 30 cm soil depth in 2019 and 2020



09.12.2021 approaches and results of two-year trials in the North Sea Region"





Bionext, Netherlands

C_{org}-stock [Mg ha⁻¹] in 30 cm soil depth in 2019 and 2020



Treatments	without/with compost 30 Mg ha ⁻¹		solid manure 40 Mg ha ⁻¹ / only green manure	
Management/year	2019	2020	2019	2020
Сгор	pumpkin	potatoes	Pumpkin	summer wheat-field bean mixture

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Germany:

- No significant differences of C-stocks in the topsoil between the treatments in 2020 after two years of carbon farming management (cover crops, tillage, moderate organic input).
- No significant differences of C-stocks in the topsoil and subsoil between cropland and poplar plantation in Central Germany after ten years of cultivation.
- **Selgium:**
 - Significant higher C-stocks in 2020 on the treatments "reduced tillage" and "woodchips" than on controls "tillage" and "without wood chips", respectively.
- Netherlands:
 - Significant higher C-stock in 2020 on the treatment "compost" and "solid manure" than on "without compost" and "only green manure", respectively.

Conclusion: No significant increase of C-stock in treatments with low amount of external biomass (manure) supply in Germany in contrast to experiments in Belgium and Netherlands with high amount of external biomas.

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Thank you for your attention!

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