Organic Farming and Climate Change

Potential for greater climate change adaptation and mitigation for EU's agriculture

BIOFACH 2018

SOLMACC

Strategies for **O**rganic and **L**ow-input farming to **M**itigate and **A**dapt to **C**limate **C**hange

→ Demonstration project funded in part by the EU LIFE programme

- **LOCATION**: Germany, Italy, Sweden and Belgium
- **DURATION**: Start: 01/09/2013 - End: 31/08/2018
- **CONSORTIUM**: IFOAM EU (coordinator - BE), Ekologiska Lantbrukarna (SE), AIAB (IT), Bioland Beratung GmbH (DE), FiBL (DE)

12 SOLMACC demonstration farms

SOL MACC
ORGANIC FARMERS COUNTERING CLIMATE CHANGE

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*"Thanks to the SOLMACC practices, **I will play a role** in the fight against the climate change!"*

Claudio Caramadre (IT)

Climate Change Mitigation and Adaptation - Results from the SOLMACC Project

Lin Bautze (lin.bautze@fibl.org)
Scientific Coordination SOLMACC

Complex Challenges for the EU Agriculture

Agriculture has to support several sustainability goals:

- Reduce GHG emissions
- Adapt farmers to unavoidable climate change risks
- Protect ecosystem services
- Financial, technical and ethically viable
- Ensure food security
- Promote a healthy diet for consumers

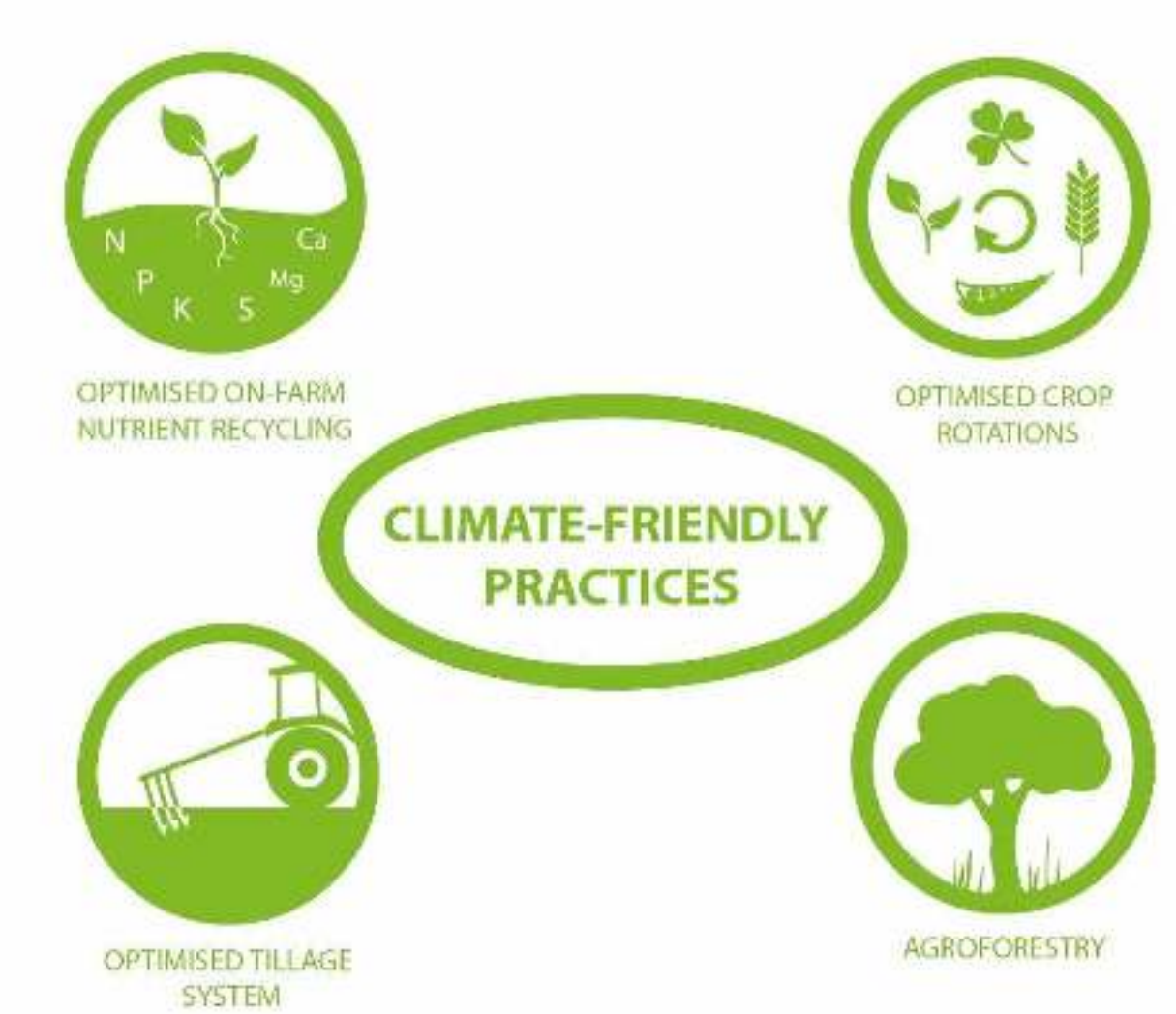
The Potential of Organic Agriculture

Organic agriculture has synergies:

- no synthetic fertilizers are applied
- emissions from livestock feed consumption are reduced
- higher carbon sequestration (Gattinger et al., 2012),
- lower N_2O emissions per hectare (Skinner et al., 2014)

➢ around 17% of agricultural GHG emissions could be reduced (Muller et al. 2016)

48 SOLMACC Practices



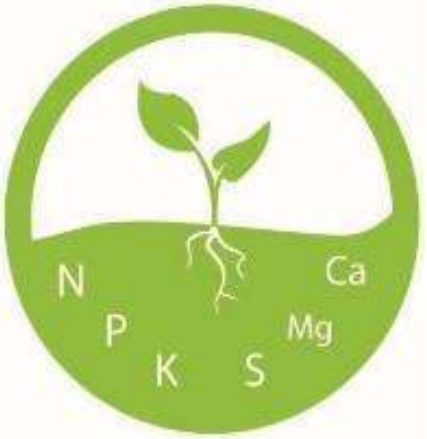
Pictures (from top): © Gut Krauscha: Turning of the compost piles ©Daniele Fontanivse – Cabbage field at Caramadre,Alföldi, FiBL,© Kjell Sjelin in Hånsta Östergärde

Optimized Nutrient Management

- composting
- MC treatment
- biogas production and/or utilization
- mobile livestock systems

Fotos (from left): © S.Griese, Krepold, ©Sötåsen, © Hånsta Östergärde

Farmyard Manure Composting*



Farm	Amount Farmyard Manure (DM t)	Reduction (total in kg CO2-eq.)		
		Minimum	Average	Maximum
Fontanabona (IT)	40	2 360	13 160	16 880
Kreppold (DE)	115	6 773	37 769	48 446
Gut Krauscha (DE)	215	12 700	70 817	90 836
Relevant mitigation potential		**- 9%**	**- 49%**	**-63 %**

*preliminary results. Calculations 2017

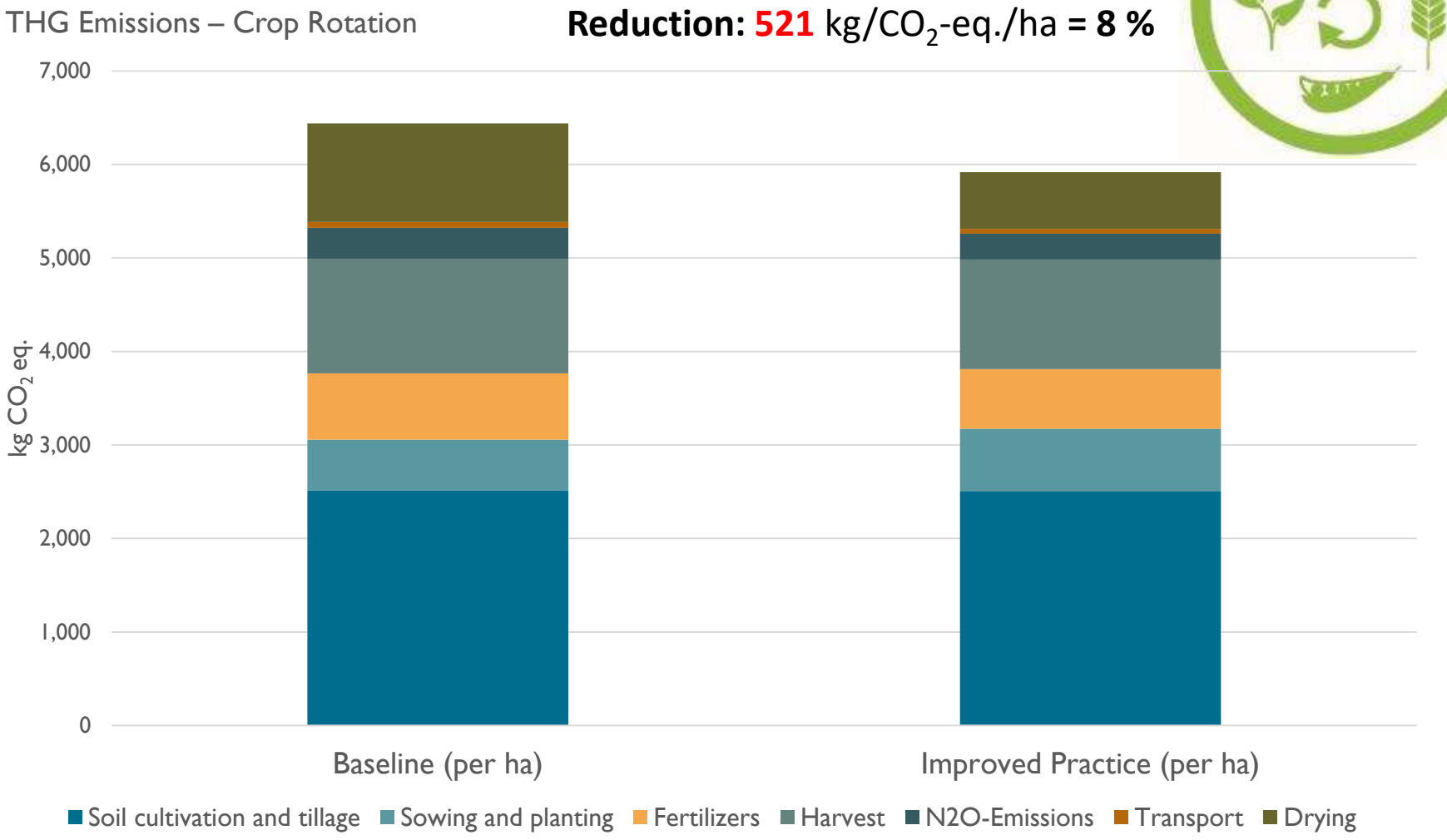
Optimized Crop Rotation

- Introduction and/or increasing percentage of grain and/or forage legumes
  - Stabilisation of soil fertility, N-fixation (Leithold et al., 2015)
  - Average C-sequestration of 0.32 Mg ha^{-1} a^{-1} by cover crops (Poeplau & Don, 2015)



Photos (von links): © Gut Krauscha, ©**Körslätts Gård** © Fontanabona

Optimized Crop Rotation: Kreppold (DE)*



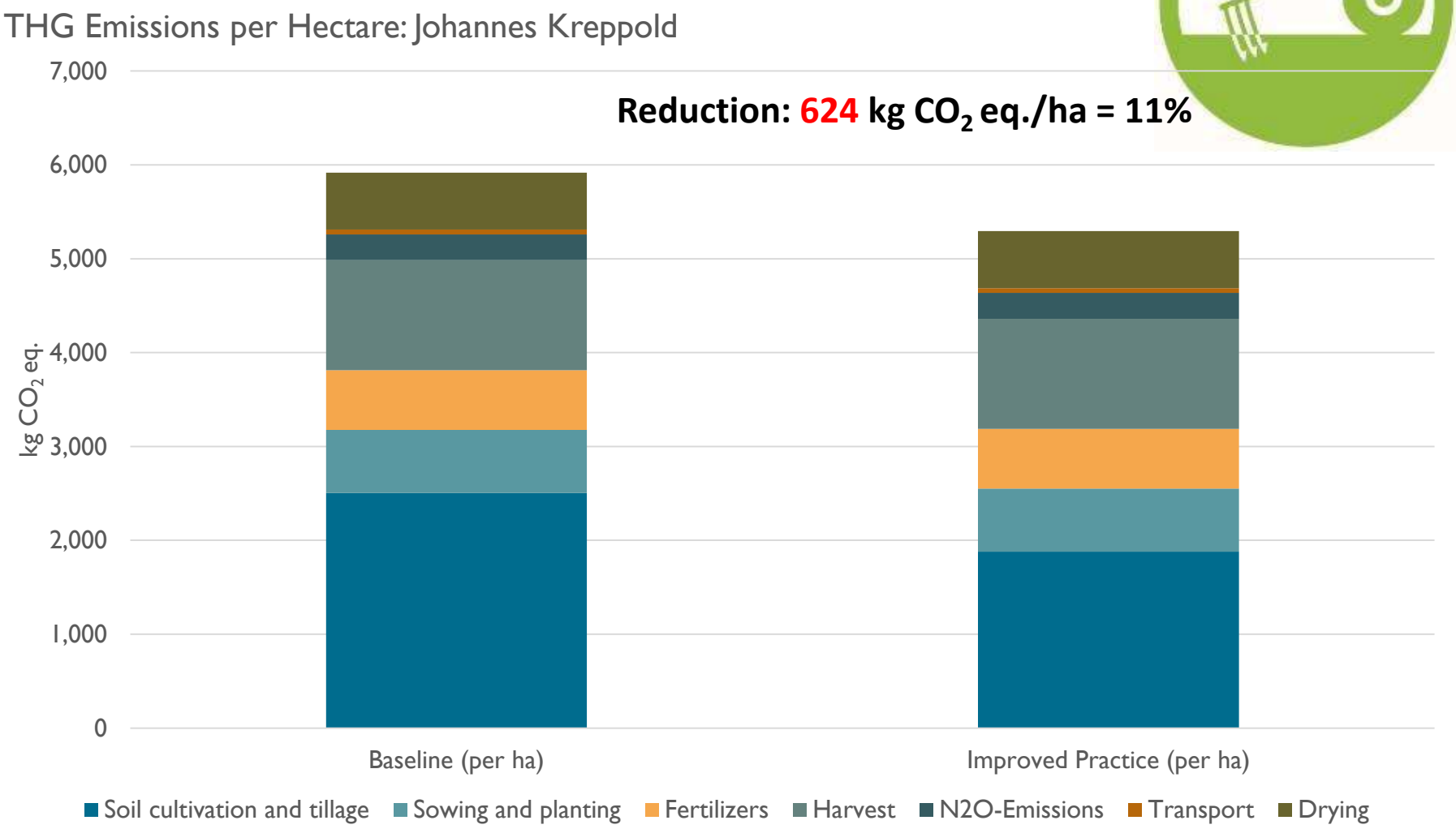
*preliminary results. Calculations 2017

Optimized Tillage

- Reduced frequency
- Reduced depth
- No tillage

Fotos (from left): © S.Griese, Pfänder ©Daniele Fontanive, Caramadre, ©S. Griese, Pfänder

Optimised Tillage: Kreppold (DE)*



*preliminary results. Calculations 2017

Agroforst and Landscape Elements

Implementation of different agroforestry systems:

- boundary hedges
- buffer stripes
- alley cropping
- silvopasture (lifestock integration)




Fotos (from left): © Hånsta Östergärde © Kreppold, © Haus Holte

Agroforst: Kreppold (DE)*

8 ha: (boundary hedges: 1 ha, forest: 7 ha)

C-accumulation in tree biomass (above and below-ground): 5,1 – 7,8 t/ha/year = 35.7 - 54,6 t/year

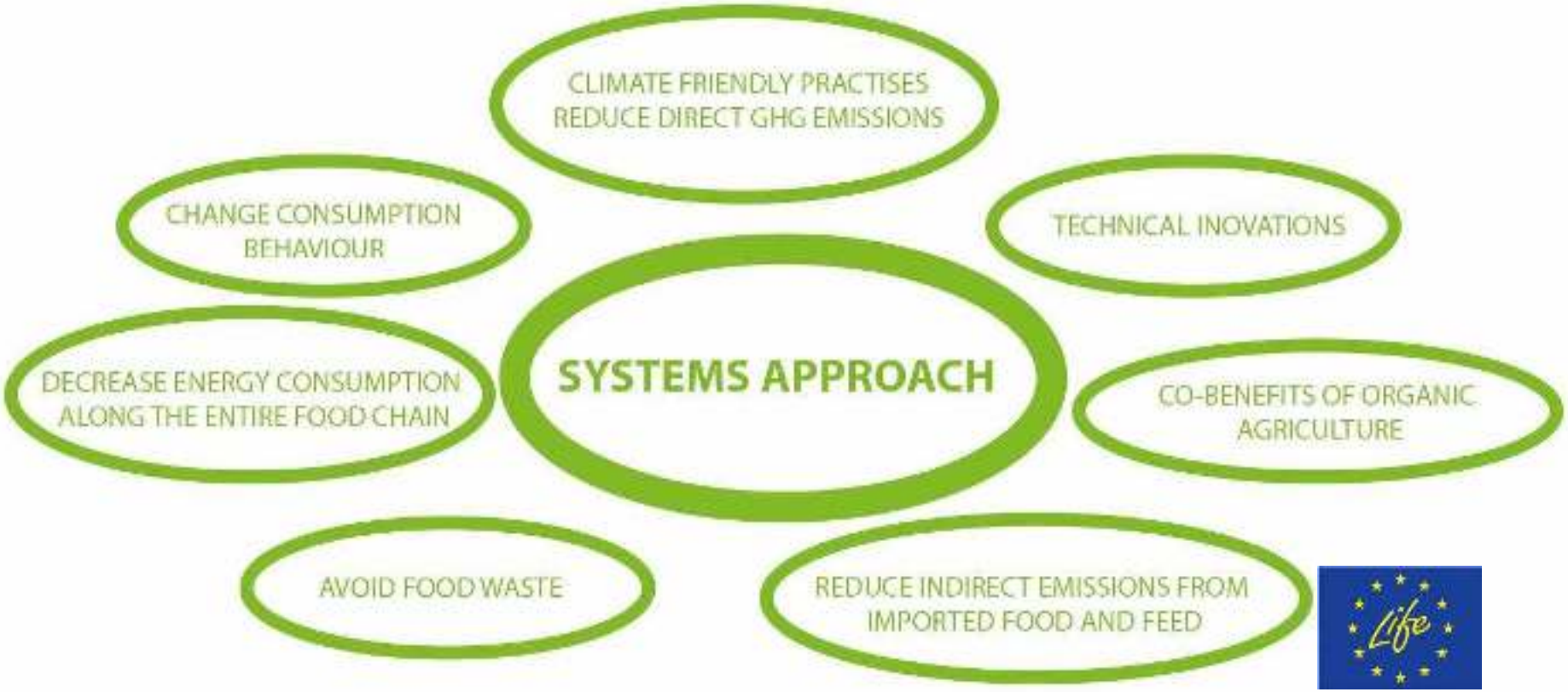
C hedge biomass (above-ground): 1,64 – 4,8 t/ha

C-sequestration soil: 0,455 t/ha/year = 3,64 t/year (based on Schrumpf et al., 2014)

*preliminary results. Calculations 2017

Conclusions

- Agriculture system has to achieve many goals
- Organic agriculture has a high potential for synergies



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Thank you very much for your Attention!
Do you have Questions?

Vielen Dank für Ihre Aufmerksamkeit!
Gibt es Fragen?

SOLMACC is supported by the LIFE programme

For further information

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SOLMACC is supported by the LIFE programme (agreement number: LIFE12 ENV/SE/000800). The sole responsibility for the content in this presentation lies with the presenter and the communication reflects only the presenter's view. The European Commission is not responsible for any use that maybe be made of the information provided.