Organic farming and biodiversity

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Regulation and standards for organic production

Organic production

Public goods

Nature and biodiversity

Soil and environment

Human health and welfare

Livestock health and welfare

Energy and climate

Rural districts

Business

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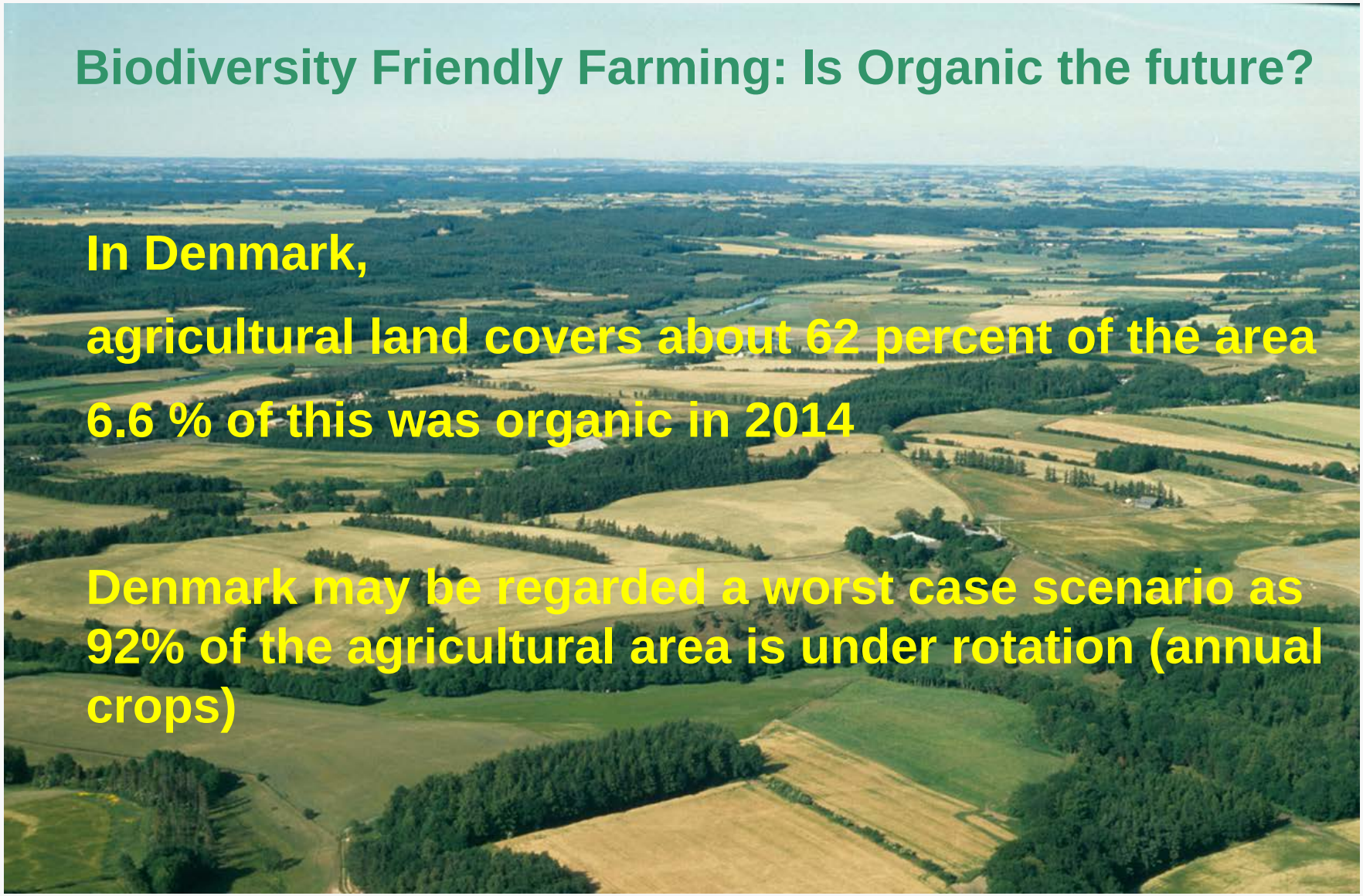

Biodiversity Friendly Farming: Is Organic the future?

In Denmark,

agricultural land covers about 62 percent of the area

6.6 % of this was organic in 2014

Denmark may be regarded a worst case scenario as 92% of the agricultural area is under rotation (annual crops)

Biodiversity a public good, threatened by land use

Agricultural intensification (nutrient and pesticide deposition, drainage, habitat fragmentation) a major cause for decreasing biodiversity (e.g. Chamberlain et al. 2000, Benton et al. 2002, Donald et al. 2006, Stokey et al. 2011)

Biodiversity in fields but also in areas adjacent to agricultural fields are affected

Continuous decrease in biodiversity – species disappear at increasing rate (EEA 2006, 2010)

About ¼ of Danish species belonging to an organism group are red-listed

Organic farming and biodiversity

Comparative meta-analyses (Bengtsson et al. 2005, Hole et al. 2005) showed on average 30% more species at organic farms than at conventional

This result has been robust over the last 30 years (Tuck et al. 2014)

Large variation around the average dependent on organism group, crop, landscape and duration of the organic management

Largest benefits was found in cereals, among plants and pollinators, and in landscapes with high land-use intensity (Tuck et al. 2014)

Regulations and standards important for organic farming's contribution to biodiversity (public goods)

Factors determined by regulations and standards	Factors derived by regulations and standards	Factors independent of regulations and standards
• No pesticides • Use of organic fertilizers • Grazing required for cattle • Outdoor areas for pigs and poultry	• Crop rotation and diversity • Tillage - Mechanical weed control • Crop densities generally lower than conventional	• Field size • Area with and distance between natural habitats • Management of grasslands

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Biodiversity increases support more ecosystem services

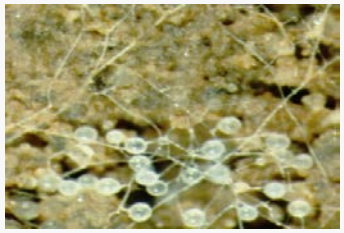
Organic farming	Conditions for farmland species	Biodiversity	Ecosystem functions	Ecosystem services
Farming practice and land use	Habitat quantity and quality	Diversity and abundance determined by habitat condition	Determined by biodiversity	Determined by biodiversity

Organic farming support more plants, pollinators and natural enemies of pests

Organic farming may support soil organisms but results are ambiguous

Organic farming support ecosystem services e.g. pollination, soil fertility, soil structure, nutrient and water availability, pest control

Organic farming can support public goods



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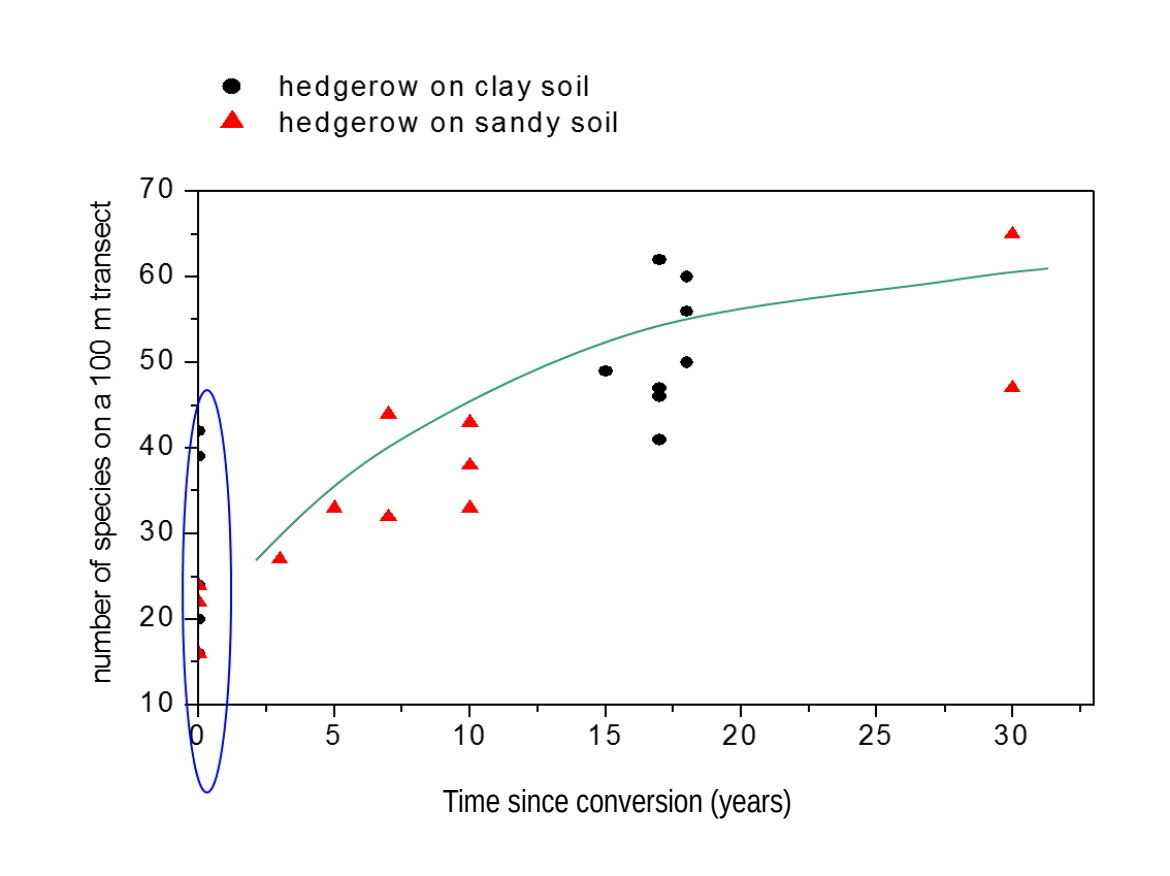
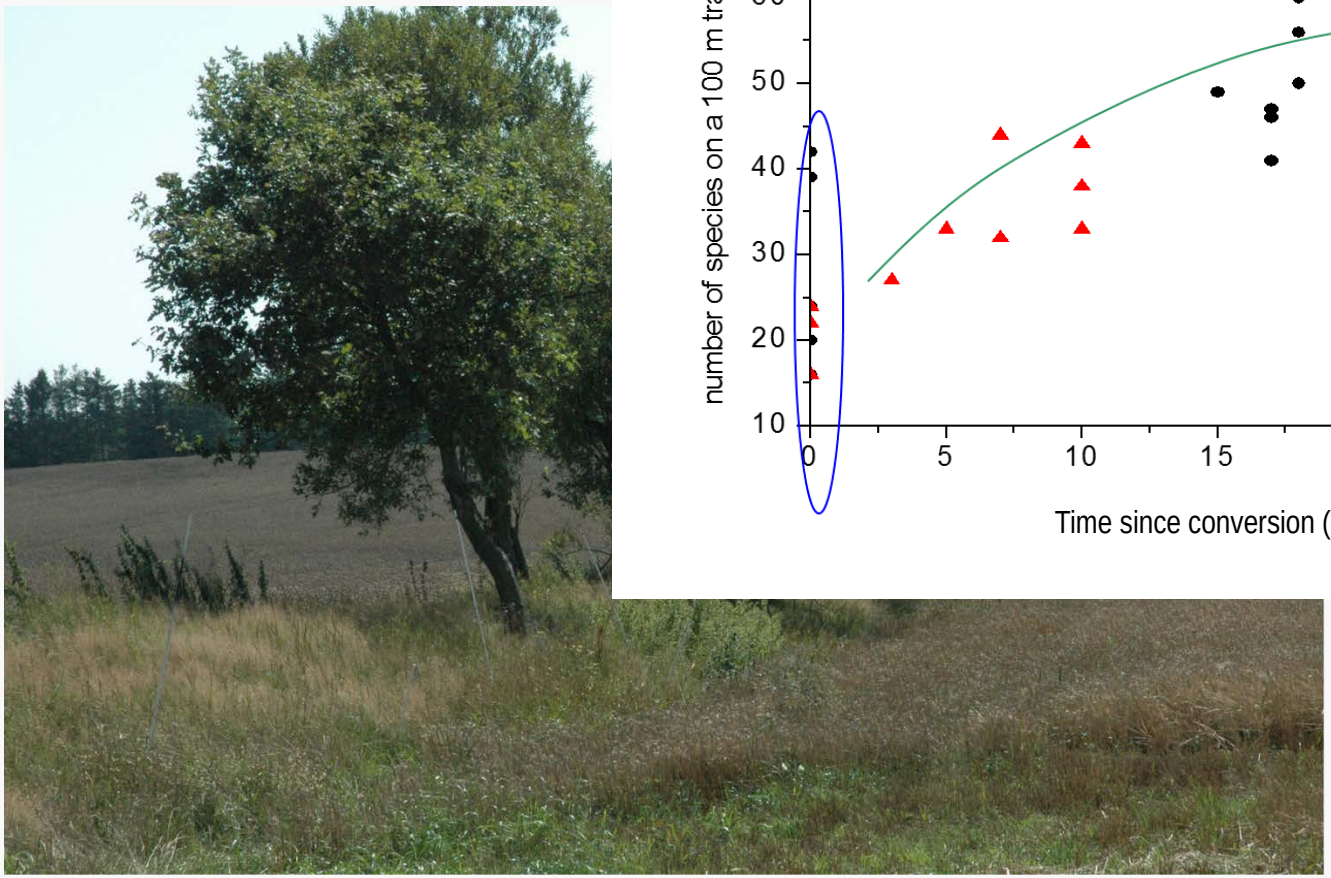
Biodiversity may take time – management continuity





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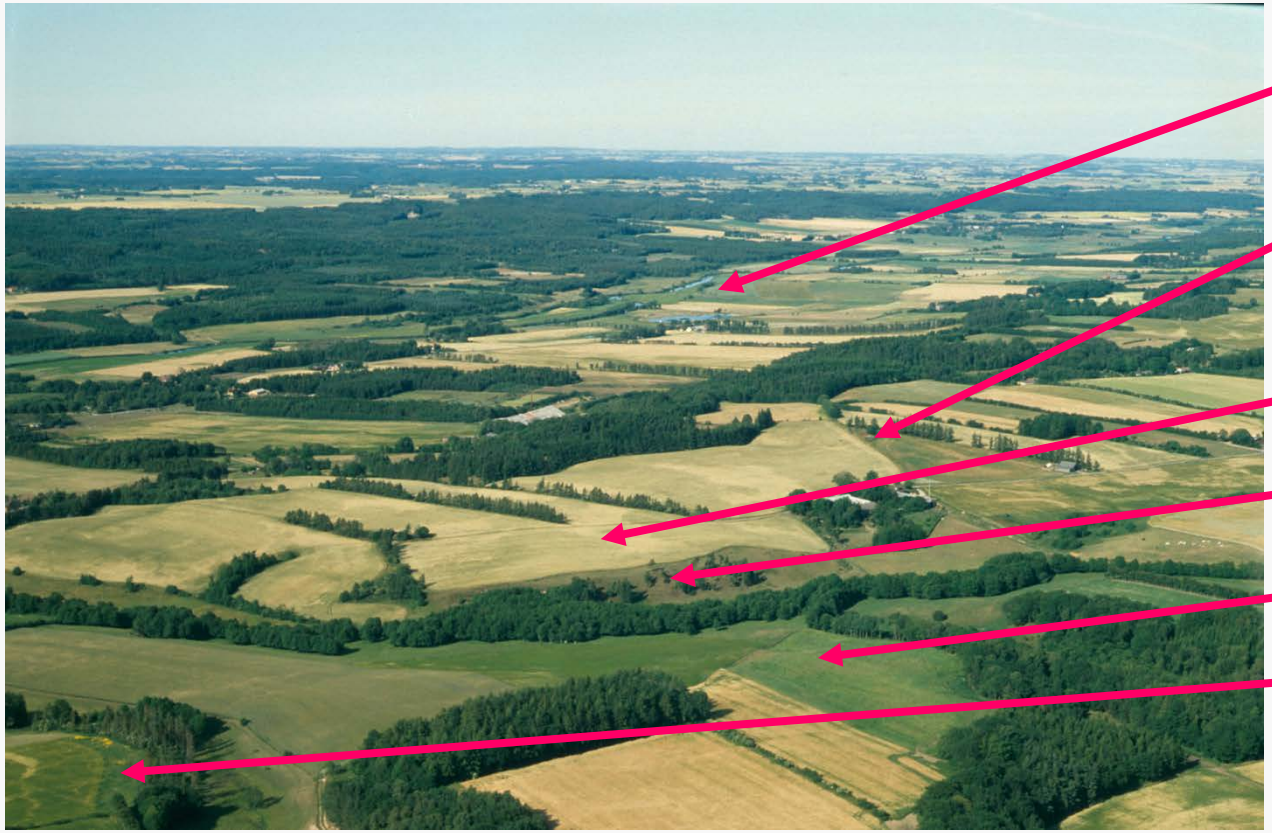
How can the biodiversity gains be improved?

Allow more ecological space and utilize synergies



Protect HNV-areas

Leave un-productive areas for nature

Reduce tillage

Utilize spill-over

Include perennial crops

Grazing as conservation management

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Biodiversity Friendly Farming: Is Organic the future?

Take-home message:

Generally, organic farming support biodiversity and ecosystem services

Reduced tillage for organic practice should be developed

Synergies between farming and nature can be better

Incentives to leave un-productive areas for nature

Farmers tools to document benefits need to be developed

Thanks to co-authors, ICROFS and ELO

Thank you for your attention
Questions are welcome

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