



Multifunctional Windbreaks

Multiple uses of windbreaks for sustainable food production,
for reducing erosion and for increasing regional added value

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and the team of

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unser Boden
wir stehen drauf!

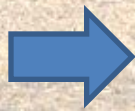


Multifunctional Windbreaks

- Wind erosion in open agricultural landscapes endangers the soil
- Windbreak planting in Austria since 18th century
in Lower Austria intensively in 20th century

BUT Farmers are reluctant

How to overcome?



Multiple uses of windbreaks in an agroforestry system

- for sustainable food production,
- for reducing erosion and
- for increasing regional added value

Project funded by the Government of Lower Austria through the Landschaftsfonds

Windbreaks protect

- **from wind erosion**

for areas between the windbreaks
planted by the authority for land reform

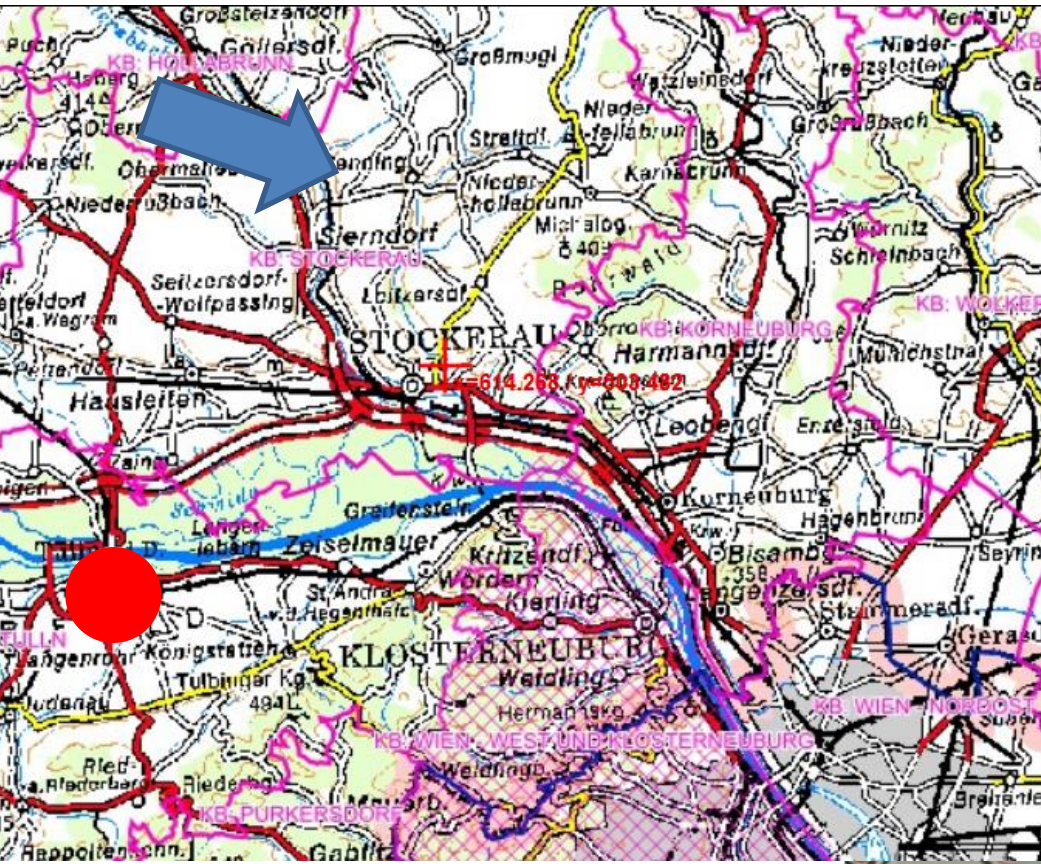
- **increase yields**

- **from water erosion**

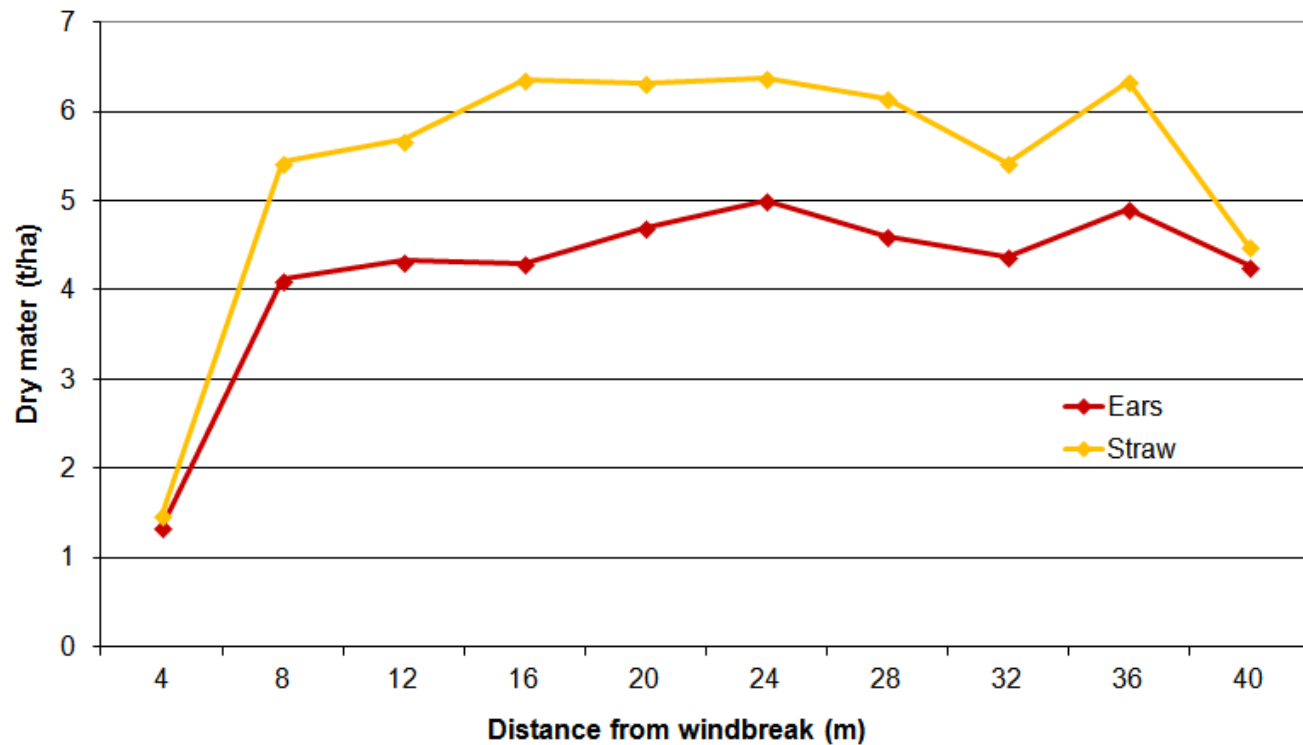
special shelterbelts with retention basins
concept by the Association Landscape and Water, Petzenkirchen

- **improve local water balance**

Effect of a windbreak on cereal yield – field experiment



Spelt yield 2017 on the leeward side of the windbreak



Wild fruit and nuts

- greengage (Kriecherl, *Prunus insititia*)
- Strauchweichsel (*Prunus fruticosa* x *Prunus cerasus*)
- cornel cherry (Kornelkirsche, Dirndl, *Cornus mas*)

Marketing as a regional treat „Pielachtaler Dirndl“, „Waldviertler Kriecherl“

serviceberry (Felsenbirne, *Amelanchier* sp.),
wild blackberry (Wildbrombeeren; *Rubus fruticosus*)
hawthorn fruits (Weißdornarten, *Crataegus* sp.),
mountain ash (Eberesche; *Sorbus* sp.)
and many others



Warm microclimate leeward on the sunny side

- herbs (basil, oregano, lemon balm etc.)
- vegetables
- Exotic fruits:
pawpaw (*Asimina triloba*),
persimmon (*Kaki, Diospyros kaki*)

Use of wood

- **short rotation coppice**

with native shrub species or with fast-growing energy tree species

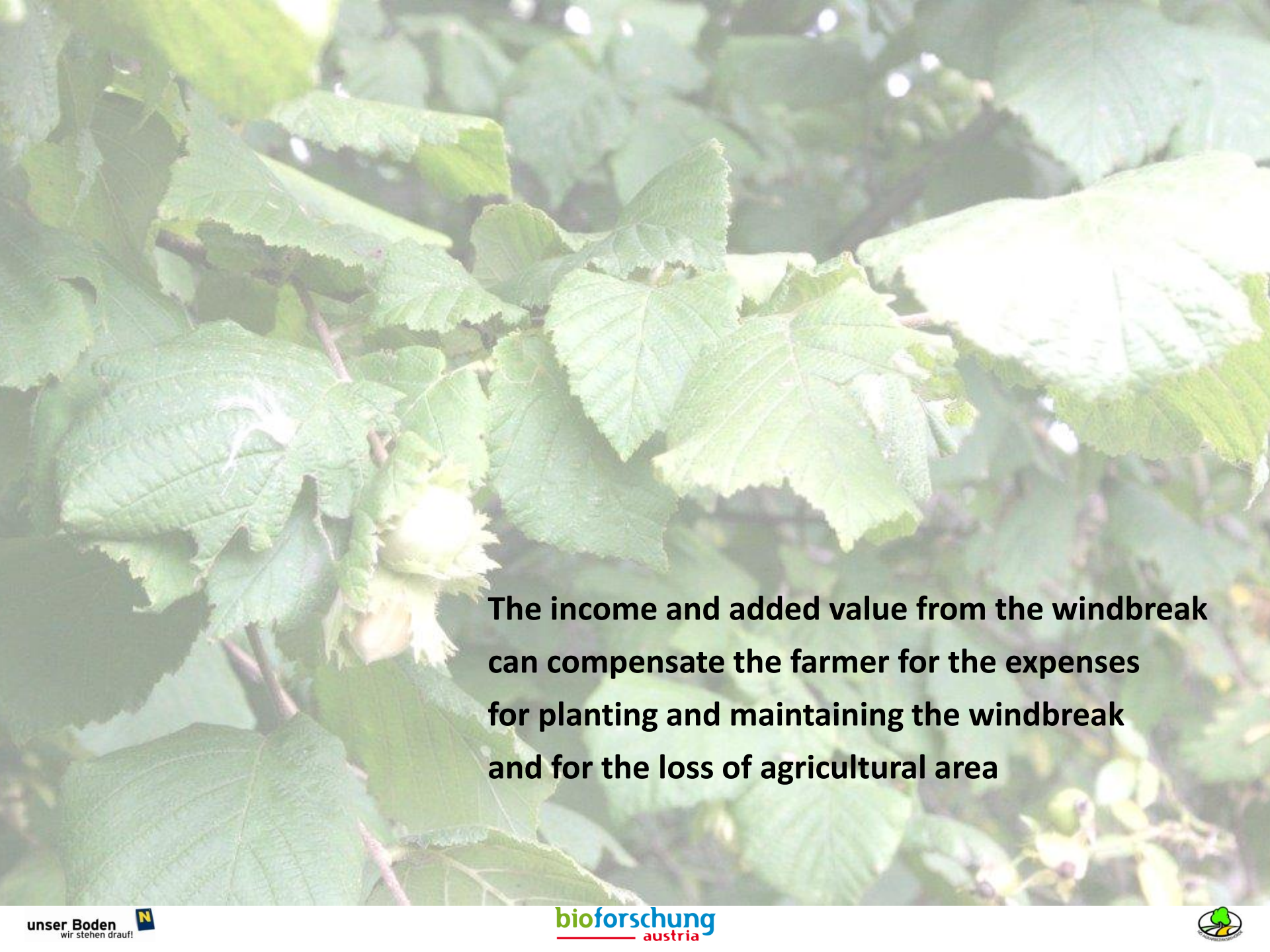
- **herbaceous energy plants**

giant miscanthus (*Miscanthus sinensis*), Virginia mallow (*Sida hermaphrodita*)

- **wood for turnery, instrument making, bows, etc.**

- **materials for natural floristry**





**The income and added value from the windbreak
can compensate the farmer for the expenses
for planting and maintaining the windbreak
and for the loss of agricultural area**

Windbreaks link biotopes

migration routes for endangered species,
for recolonisation of areas



New multifunctional windbreak

- will include wild fruits and rare and exotic fruits
- soil and weed management: organic no-till
- promote biodiversity
- monitoring of insect biodiversity

Added value for society

Recreation quality

- **humans love structured landscapes – feel-good factor**
- **holidays in the local countryside**
- **touristic development**
- **climate protection**



Flexible management of cover crops in viticulture



- Cover crops adjusted to needs of the vineyard and to actual weather.
- Reduction of water demand of cover crops if necessary.
- Measurements of water stress of grapes.
- Measurements of soil water status.



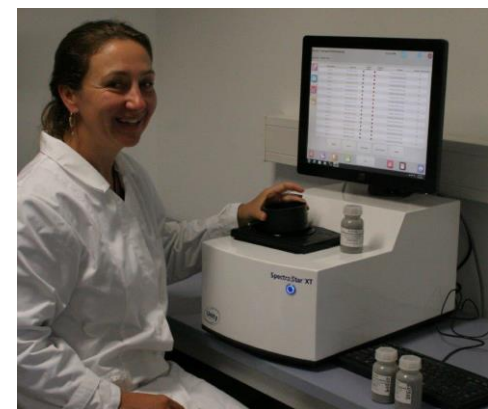
Focused humus management for the soils of Lower Austria

- Calculation of the humus deficit for the soils of Lower Austria and graphic presentation as humus map
- Devising of measures to preserve and increase soil humus content specifically in the regions with the highest humus deficits
- Elaboration of a handbook for focused humus management
- Demonstration fields for innovative soil management methods
- Seminars for stakeholders in key regions



Project aims

- innovative technologies for composting and for quality control of compost using NIR-spectroscopy
- Recycling of phosphorus: secondary raw materials from sewage sludge and biochar
- Development of a cost-effective method for measuring nitrate leaching into the groundwater using ion exchange resin technology





Thank you for your attention!

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The income and added value for the farm can compensate for the expenses for planting and maintaining the windbreak and for the loss of agricultural area