



Tree fodder in silvopasture systems

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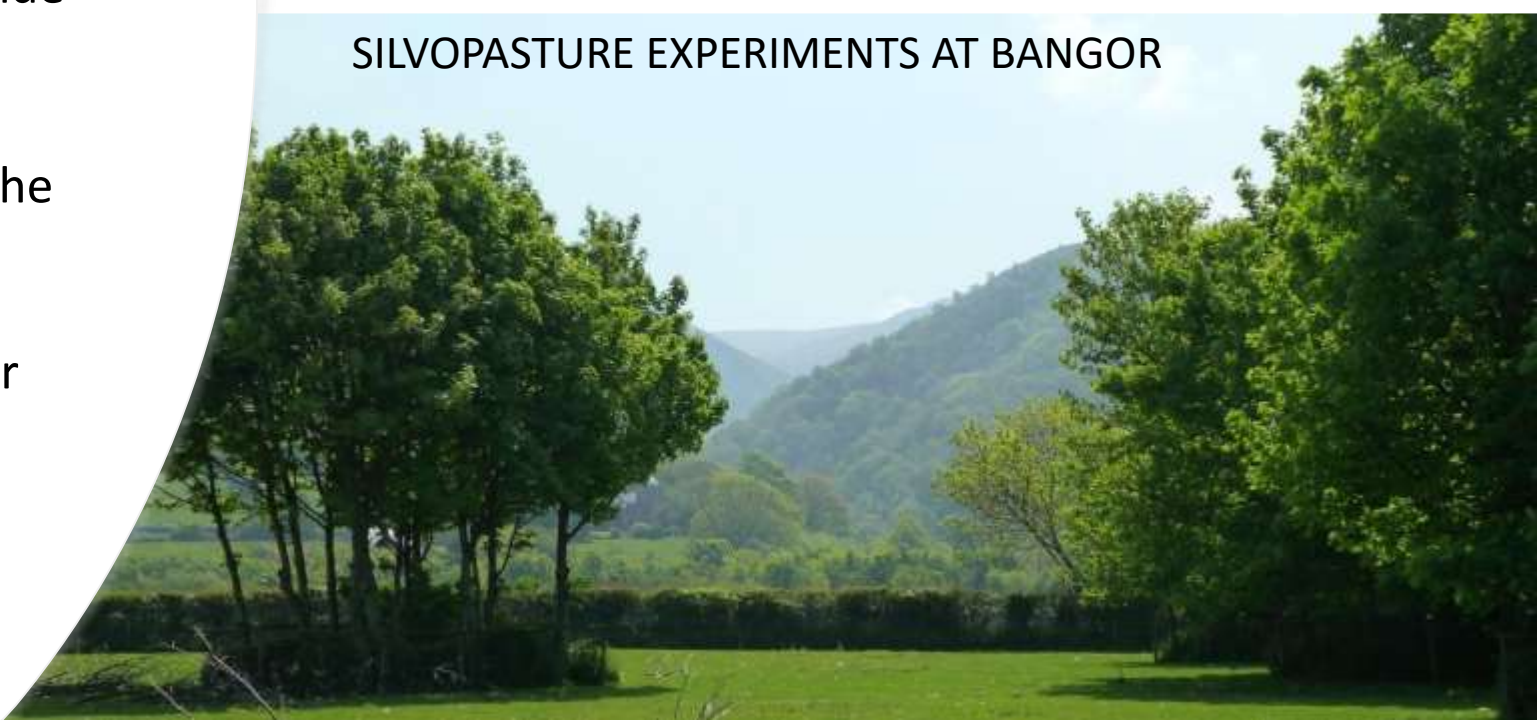
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Silvopasture

- Combinations of trees with grazed pasture
- Includes various forms of forest grazing as well as trees retained in pasture to provide fodder and either shelter or shade, or both, for animals
- Most common form of agroforestry in the UK
 - Approx. 547,600 Ha in the UK (excluding hedgerows) - den Herder et al., (2016)



SILVOPASTURE EXPERIMENTS AT BANGOR



Benefits of silvopasture



Seen as critically important climate change strategy
Ranked #9 in Project Drawdown's 100 Climate solutions

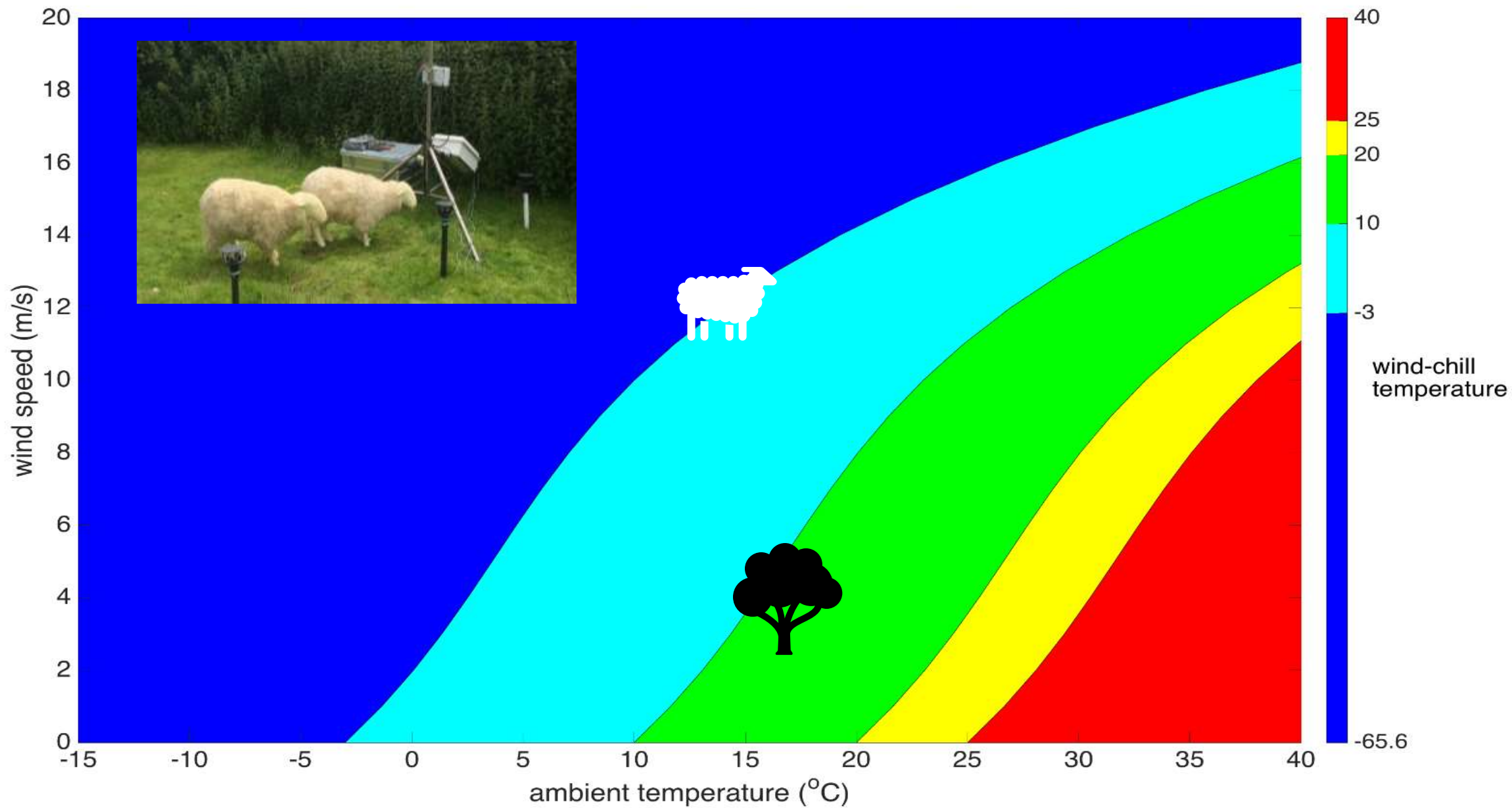
Additional On farm benefits in the form of shelter, fodder

<https://www.drawdown.org/solutions/food/silvopasture>



Shelter benefits

- Livestock productivity is all about...energy balance and welfare!
- Strategic placement of green infrastructure (shelter) such as trees and hedgerows could improve the productivity of pasture-based livestock systems





Overall, ewes that were given access to shelter experienced fewer shepherding problems than those without.

Why Tree Fodder?

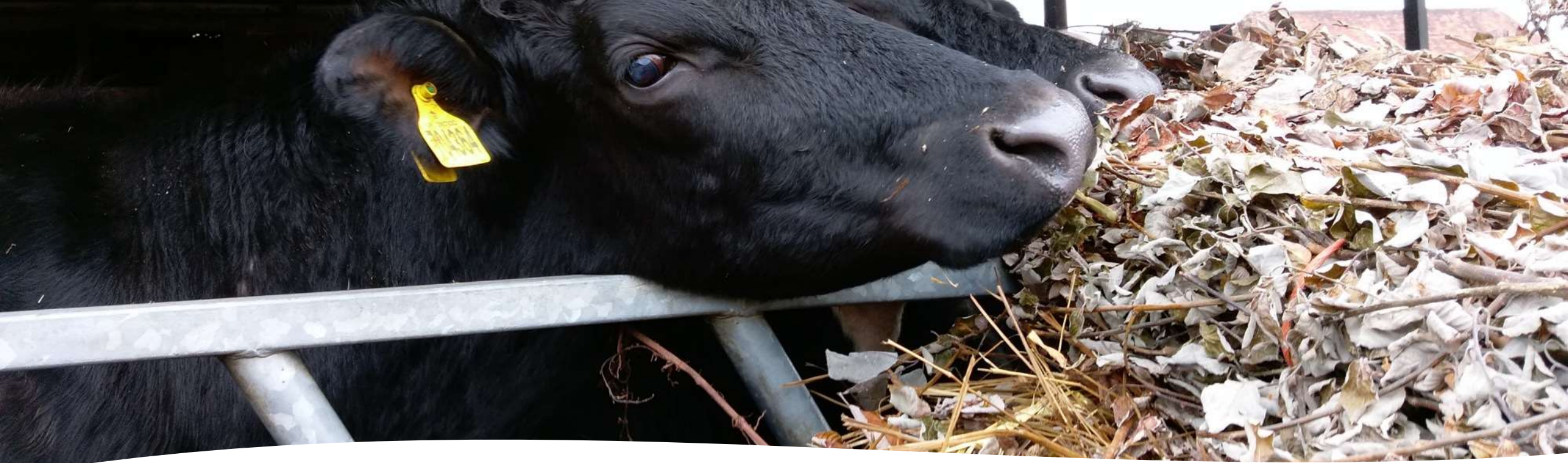
- Farmers have used fodder trees since ancient times and they were common in traditional feeding systems.
- Fodder trees are a common and important feed source for livestock in a wide range of farming systems throughout the world.
- In the UK there is renewed interest in the potential for using tree fodders particularly for addressing micronutrient deficiency and for their anti-parasitic properties associated with the secondary compounds (tannins) found in the leaves.



Tree hay Forgotten art

- Traditionally a cut and carry system
- Tree material was harvested and stored June/July
- Stored for up to 24 months
- Traditionally major species in the UK were Ash (*Fraxinus excelsior*) and Elm (*Ulmus minor*)
- Important in drier conditions as trees will continue growing when grass fodder has dried.





Why is tree fodder important?

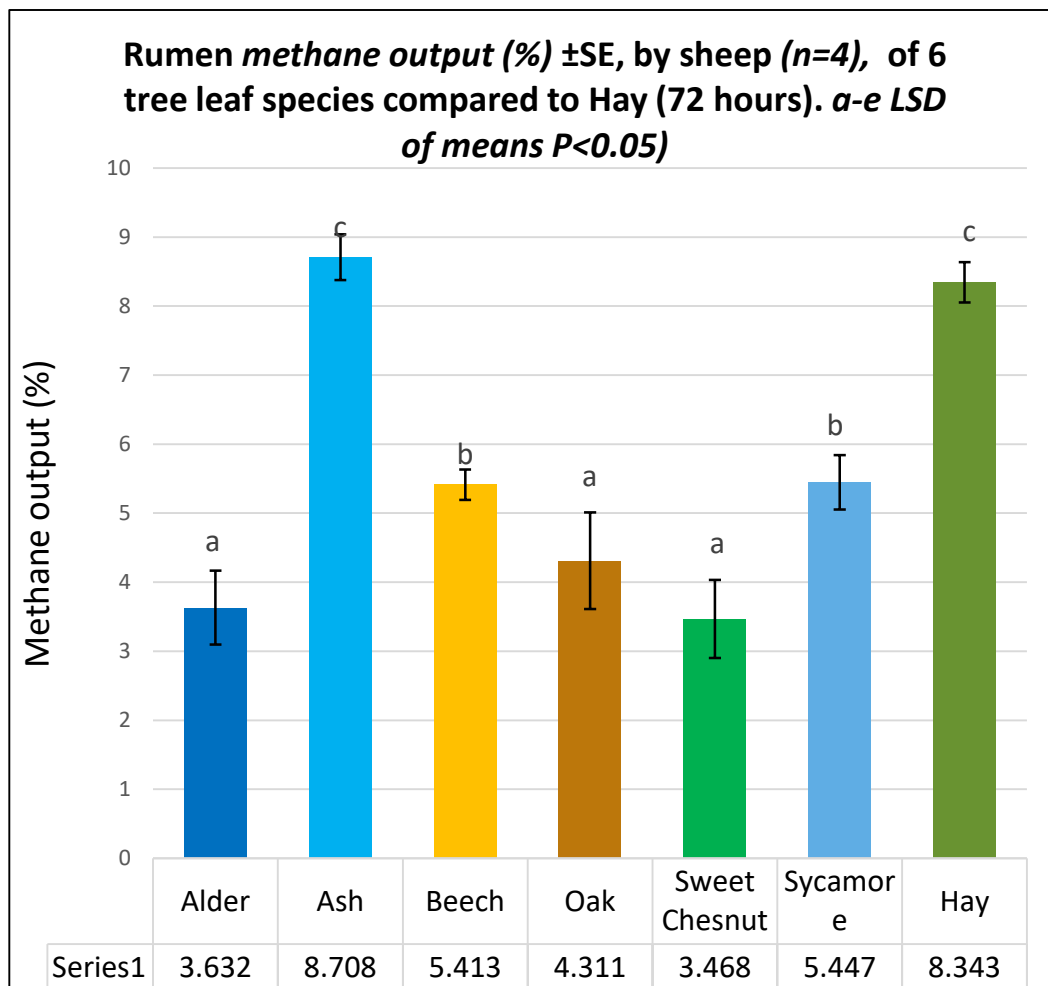
Trees generally contain higher levels of **some** micronutrients than grasses.

- Varies by species, **season** and context
- The balance of compounds found in the leaves will vary through the year (including the levels of tannins found).

As a result tree fodder has a number of potentially important properties:

- **The presence of condensed tannins may be important for increasing the flow of proteins to the intestine in ruminants**
- Presence of secondary compounds may have anti-parasitic properties (health benefits)
- **Tree fodder may improve uptake of some trace elements.**

Tree Fodder and Methane



- Methane is produced by the rumen microflora (bacteria, protozoa & fungi) that are critical to support digestion of fibrous material.
 - Microbes also use some of the energy and nutrients ingested themselves, reducing the amount available for the animal.
- Bioactive compounds (such as tannin), in tree leaves can suppress methanogenic microflora and so potentially increase the nutrient pool available for animal metabolism and growth
- More work required on understanding long term effect of tree leaf material on animal productivity, health and GHG emissions

Where now?

- Knowledge
 - Farmers will need advice on which species to grow to suit their context
 - Design will vary with farming system
 - Trial and error
- Area
 - How much land is required for tree fodder systems to be effective?
 - Row systems may be most practical in terms of feeding efficiency and ease of management but that may not fit in some systems? Are there other design options?

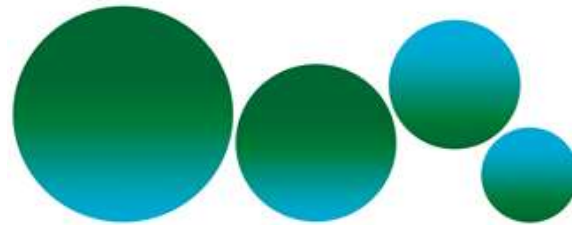
Thank you

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