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EFFICIENT AND RESILIENT
MIXED FARMING & AGROFORESTRY

The integration of grazing livestock into arable farming systems has positive impacts on animal, crop & soil parameters while maintaining yield

SRUC

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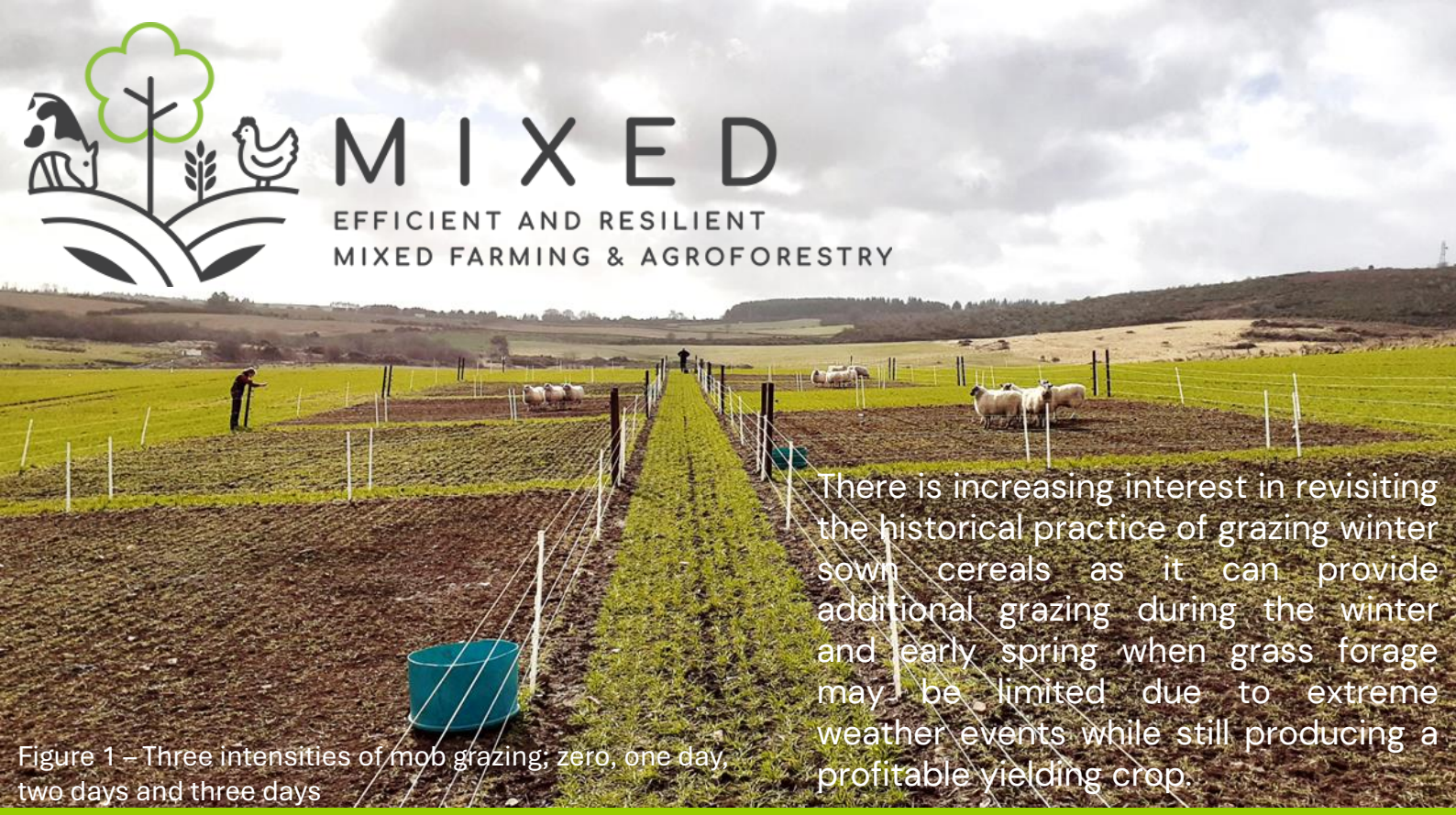

There is increasing interest in revisiting the historical practice of grazing winter sown cereals as it can provide additional grazing during the winter and early spring when grass forage may be limited due to extreme weather events while still producing a profitable yielding crop.

Figure 1 – Three intensities of mob grazing; zero, one day, two days and three days

Background

Grazing sheep on winter cereals was once common practice but has declined with the rise modern agriculture.

If successful, the practice should help fill the winter feed gap, building resilience against more extreme weather events and the associated lack of forage / fodder.

Trials in northeast Scotland over three years, with ungrazed and grazed sites, tested the impact of grazing on winter cereals across a range of crop and soil quality measures.

Methodology

Forage biomass and feeding value were assessed every few weeks from November until early May and the live weight gain of lambs was modelled.

Disease and weed pressure were assessed during the season as well as soil quality indicators using Visual Evaluation of Soil Structure (VESS) and counts of earthworms as a proxy.

At harvest, plots were yielded with a combine harvester and grain quality and soil quality indicators assessed.

We hypothesised that the grazing of winter cereals can provide a valuable winter feed source for ruminants, as well as maintain acceptable grain & straw yields, while maintaining soil "health".

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"What lessons can we learn from our innovation study which helps us to improve the efficiency and resilience of mixed farming systems in Europe?"

Figure 2 – Same site as Figure 1 but several months later with no viable differences in crop growth

Analysis of the feed value and modelled live weight gains of sheep showed equivalent if not better results than from a high-quality silage.

Winter cereals seem very resilient to sheep grazing & recover well whether "mob" grazed **or** extensively grazed as long as grazing takes place prior to stem extension. There is also evidence for a reduction in severity of crop disease early in the season.

No significant reduction in crop yield at harvest. An early sowing date / early grazing (pre-Christmas) and a typical sowing date / later grazing (e.g. March) all seem to work equally well. Potential to check very "forward" crops – e.g. due to mild winter.

Evidence of increased earthworm abundance and no detriment to soil structure.

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The lessons learned here in northeast Scotland are already being put in to practice in other countries (e.g. France)

The main take home messages:

- **Winter cereals have a very good feed value profile**

Analysis of feed value showed results equal to or better than high-quality silage, with D-values over 90% and metabolisable energy (ME) exceeding 14 MJ kg^{-1} DM. In comparison, average silage has D-values around 70%, with good quality silage offering an ME of 11.5 MJ kg^{-1} DM.

Arable farmers already getting enquiries about grazing opportunities for sheep flocks.

Winter cereals seem very resilient to sheep grazing & recover well

- **Little impact on yield or agronomic / crop quality / soil quality factors**
  - Whether "mob" grazed like in plot experiments **or** extensively grazed like on network farms
    - Early sowing date / early grazing (pre-Christmas) and typical sowing date / later grazing (e.g. March) all seem to work equally well
  - Potential to check very "forward" crops – e.g. due to mild winter
  - Few negatives, but a number of positives
    - Indication of improved worm counts / reduced cereal disease (pre-stem extension)
    - Grazing income