Grazing of winter cereals provides valuable late winter feed while maintaining grain and straw yields

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Introduction

- Can integrating grazing livestock and arable farms have positive impacts on crop & soil parameters?
  - Increased interest in revisiting the historical practice of grazing winter sown cereals.
  - Can provide additional grazing during the winter and early spring when grass forage may be limited.
- Key interests - quantity and quality of the cereal forage available for grazing, the impacts of grazing on production and quality of the grain and straw yield as well as soil "health" impacts.
- To explore these questions, a number of trials have been carried out at SRUC Craibstone in Aberdeen and several other farms across Scotland.

Methods

- Replicated plot grazing experiments similar to those shown in Figure 1 and Figures 2 & 3.
- Three replicates of four grazing treatments - 'no grazing' and grazing for one, two and three days.
- Forage biomass and feeding value were assessed every few weeks from November until early May (Table 1).
- Tillering, disease and weed pressure were assessed during the season as well as Visual Evaluation of Soil Structure (VESS) and worm counts after harvest.
- At harvest, plots were combined and measurements of yield, straw yield and 1000 grain weight were taken.

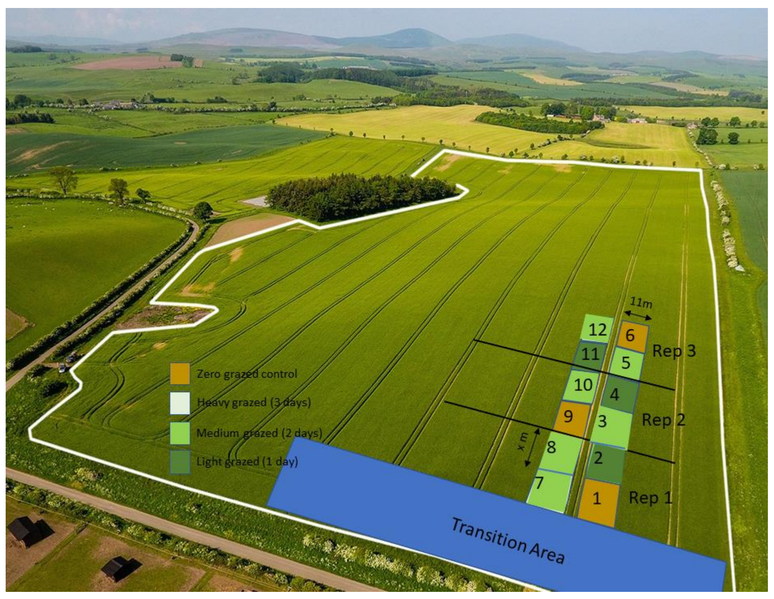

Figure 1 – Example of a plot layout for grazing experiments

Results

Forage

Table 1 – Example of forage quality throughout the season

		16/11/21	15/12/21	17/01/22	16/02/22	21/03/22
Determination	**Units**	**Result**	**Result**	**Result**	**Result**	**Result**
Ash	g/kg DM	208.767	167.039	121.285	172.600	89.532
Crude Protein	g/kg DM	323	300	323	270	249
Modified Acid Detergent Fibre	g/kg DM	255	234	199	242	171
D Value	%	86.19	87.02	92.58	84.07	90.74
Hay ME (WET CHEM)	MJ/kg DM	13.4	13.5	14.3	13.0	14.1

Figure 2 – Example of plot design showing grazed and ungrazed plots

Figure 3 – same site as Fig 2 mid-season showing no visual difference

Assessment of crop during season

- No clear influence on tillering, disease and weed pressure or key development dates.
- No clear influence on measured soil "health" parameters e.g. VESS, worm count, bulk density.

Yield

- Example data set for yield is shown from the 2020-21 season at Craibstone (Figure 4).
- No statistical difference between yields of plots grazed for different periods. A surprise given the visual differences at the time of grazing (Figure 2).
- Average grain yield of 8263 kg ha^{-1}
  - no clear trend between treatments.
- Average straw yield of 2115 kg ha^{-1}
  - no clear trend between treatments.
- Very similar trends for data at the same site in other years.

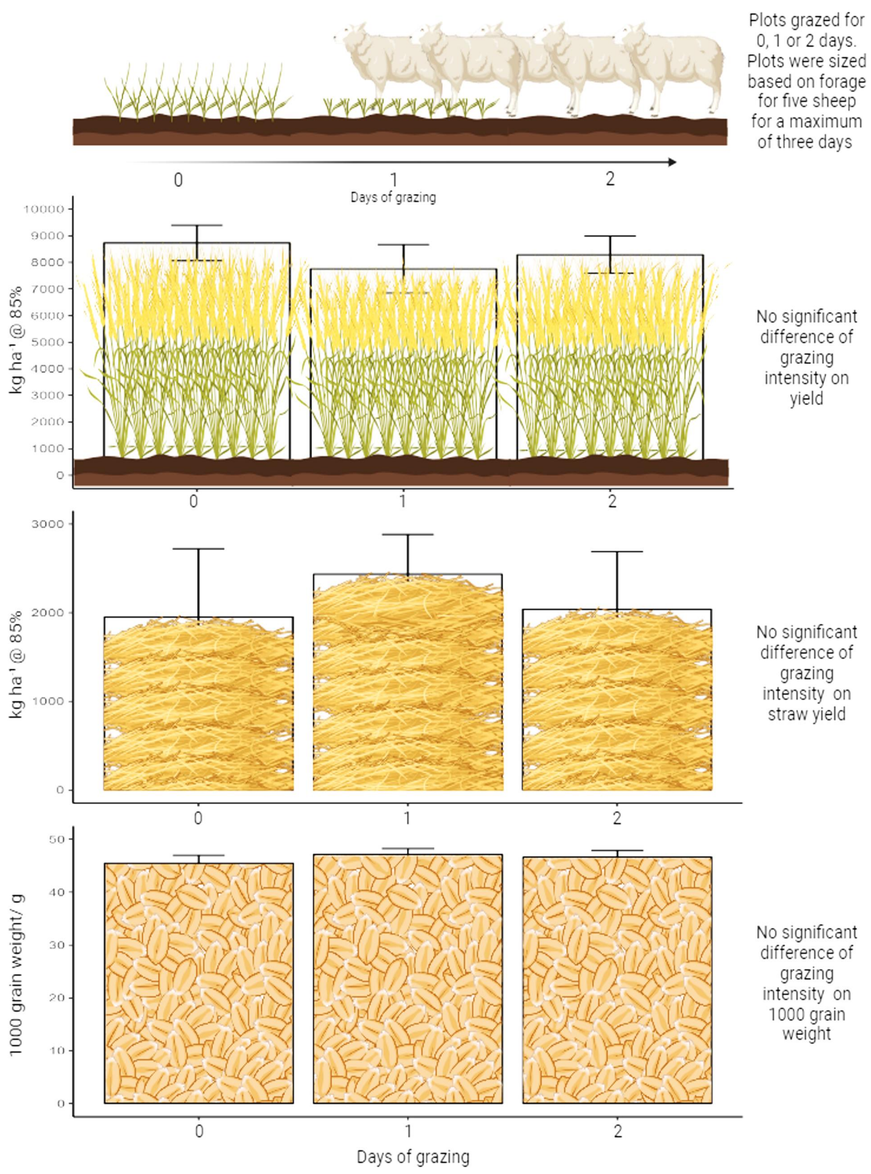

Figure 4 – Example yield data from first trial at SRUC Craibstone

Conclusion

- Winter cereals appear very resilient to being grazed
  - recover well with little impact on yield or other agronomic / crop quality
  - … but be aware of potential damage to growing points.
- Can be "mob" grazed like the Craibstone plots or more extensively grazed like many of the Network farmers.
- Early sowing date / early grazing (pre-Christmas) and typical sowing date / later grazing (e.g. March) all seem to work equally well.
- Some evidence of reduced disease levels with potential scope to reduce fungicide sprays on some Network farms.
- Some Network farmers report using reduced seed rates and N fertilizer when grazing their winter cereals
- Winter cereals also appear to have a very good feed value profile
- No disbenefits to soil "health" observed.

Figure 5 – Farmer engagement at Craibstone plots as well as Network Farm

Impact and Engagement

- Network farmers have tried winter grazed crops ranging from winter wheat, winter oats and winter barley as well as cover crops and oilseed rape.
  - most farmers used split fields to compare grazed and ungrazed areas.
- In all cases to date, very little difference has been found in key production (e.g. yield) or soil parameters similar to those mentioned for the smaller plot experimental work.
- Some graziers asking network farmers when they can get their sheep on the crops.
- Interest in the project gaining momentum
  - various requests to engage with student and grower groups (see Figure 5)
  - demonstration on Craibstone plots and Network Farms
  - podcasts, webinars, etc
  - media articles
- Farmers giving it a "go" after having seen or heard about the MIXED project's activities.

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