



Sustainable winter dairy grazing on arable farms

Introduction

Winter dairy grazing provides good cash flow to arable farmers and is seen as a mitigation option for nutrient management by the dairy sector. However there are a number of challenges to the long term sustainability of this activity. These include concerns about the nutrient loading following intensive grazing and the long term impacts to the productive capacity of soils. This project collected information from farmers across the North and South Islands about the perceived risks and current management practices for winter grazing.

What we learned

Arable farmers generally have a good understanding of the benefits of good soil quality and attempt to maintain good soils through good management. Farmers are using long crop rotations to allow soils to recover after a grazing season.

The impacts on the profitability of the farm system cannot be assessed on the winter grazing crop alone. Think about the cost of extra cultivations afterwards, delays in spring sowing, and possible yield losses from damaged soils and delayed spring sowing.

Arable farms that have control over grazing management are more likely to apply mitigation strategies. Where the host farmer is less involved in daily grazing management, good communication with the dairy farmer and some basic ground rules can help.

Not every winter grazing paddock is the same due to differences in soil type, climate, crop, or landscape. Therefore, the same management practices don't necessarily apply in every case.

Gaps in knowledge

Regular cultivation of arable soils makes them more at risk of soil damage from grazing, but little work has been done to investigate the short and long-term yield impacts of intensive grazing on future arable crop production.

In some cases, winter grazing crops are being grown in consecutive years over a long period. It is known that this can create problems with brassica diseases, but less is known about the risks for fodder beet. These risks are likely to extend to weed and pest issues, including weedy beet issues from uncontrolled bolters.

Basic technical training for staff managing grazing on a day-to-day basis about the impact of winter grazing and how to implement good management practices could go a long way, but currently there is no programme addressing this.

Risk management guide

Risk varies from one paddock to the next. The following risk management guide is designed to help identify which risks (N loss, P and sediment loss, structural damage) apply to a paddock and then links those risks to some appropriate management practices.

Key points

- There are concerns about nutrient loads following intensive grazing and the long term impacts to the productive capacity of soils.
- Arable farmers generally have a good understanding of the benefits of good soil quality and use long crop rotations to allow soils to recover after grazing.
- Arable farms that have control over grazing management are more likely to apply mitigation strategies.
- There is no one size fits all good management practice as soils, climate and landscape vary between regions, farms and paddocks.
- A risk management guide can help identify risks and mitigation strategies.

Risk Management Guide for Intensive Winter Grazing on Arable Farms

Yes/no	Risk factor	Risk of nitrate leaching	Risk of P and sediment losses	Risk of compaction and pugging	Risk management options
	Light soils (sandy, stony)	✓			1
	Heavy soils		✓	✓	1, 2, 4, 6
	Poor soil structure		✓	✓	1, 2, 4, 6
	Steep slopes		✓		1, 4, 5
	Critical sources (waterways, natural drainage streams)		✓		1, 5, 6
	High stocking density (cows/ha/day)	✓		✓	3, 6
	High soil residual N levels	✓			1, 2, 3
	High protein level in feed	✓			3, 6
	Lack of knowledge or skills in staff managing winter grazing	✓	✓	✓	1, 5, 6
	Consecutive winter cropping	✓	✓	✓	2
	High rainfall (all above risk factors are intensified with high rainfall)	✓	✓	✓	1, 2, 3, 4, 5, 6

Instructions: Answer 'yes' or 'no' to each risk factor in your winter grazing system. For each 'yes' check the associated risks of nitrate leaching, phosphorus (P) and sediment losses, and soil damage through compaction and pugging. Risk management options relevant to each risk factor are listed in the last column (above) and refer to the table below.

Risk Management Options

1. Paddock awareness	Some paddocks may need to be avoided completely. Only graze high risk areas in dry conditions. Graze heavier soils early in the season before they get saturated, and light soils later in the season after the biggest risk of drainage. Begin grazing at the top of the slope and work downhill. When near waterways, begin grazing away from the critical source and work towards it, leaving an appropriate buffer zone.
2. Crop rotation and cultivation	Allow paddocks to recover between grazing events (soils prone to compaction should have longer periods between winter forage crops). Fit the crop rotation so that it helps break weed, disease, and pest cycles. Minimise tillage before and after the forage crop. Sow a crop that can utilise remaining N in soil (cereal, grass) as soon as soil conditions are suitable.
3. Crop selection and management	Manage fertiliser inputs to meet crop demand. If grazing a high yielding crop, use reactive management strategies (see number 6). Graze a lower yielding crop (Italian ryegrass, forage oats) to reduce stock density requirements. Understand nutritional qualities of crops, and supplement accordingly (e.g. kale is high in protein but low in fibre, so supplement needs fibre but not protein).
4. Feed preparation	Place bales of straw or baleage throughout paddock for break feeding to eliminate the need to drive heavy equipment on vulnerable soils. Lift fodder beet in dry conditions and feed off the paddock when needed.
5. Staff training	Ensure staff responsible for managing grazing are up-skilled with management strategies to react in wet conditions (see number 6). Set up guidelines in a contract if staff from off-farm are managing grazing.
6. Managing grazing on wet soils	Shift more than once a day with small breaks before soil begins pugging. Increase amount of supplement fed, and feed out in less vulnerable areas. Back fence and use transportable water troughs to minimise hoof traffic on bare soils. Split the mob into multiple groups to reduce grazing density. Have a stand-off paddock or pad in very wet conditions.

Acknowledgements

The project was only possible with the help of participating farmers, FAR levy funding, and funding from the Ministry for Primary Industries' Sustainable Farming Fund.

© This publication is copyright to the Foundation for Arable Research ("FAR") and may not be reproduced or copied in any form whatsoever without FAR's written permission.

This publication is intended to provide accurate and adequate information relating to the subject matters contained in it and is based on information current at the time of publication. Information contained in this publication is general in nature and not intended as a substitute for specific professional advice on any matter and should not be relied upon for that purpose. No endorsement of named products is intended nor is any criticism of other alternative, but unnamed products.

It has been prepared and made available to all persons and entities strictly on the basis that FAR, its researchers and authors are fully excluded from any liability for damages arising out of any reliance in part or in full upon any of the information for any purpose.