Winter crop establishment trial

A cross-sector pilot study, run by the Hedgehope Makarewa Catchment Group and funded by Thriving Southland, with support from a range of stakeholders, was recently completed to understand how different variables affect various stock classes / livestock grazing behaviour and soil surface conditions, with an aim to reduce mud, protect soils from degradation, and minimize the runoff from grazed crop paddocks.

In spring 2020 farmers across eleven farms, including the Southern Dairy Hub, established split paddock crop establishment comparisons. Measurements/ observations were made from late May to early August 2021, with measurements of the crops staggered between sites to fit in with the farmer's plans to graze each winter crop paddock in line with their usual winter grazing practice.

The project highlighted the diversity of practices on farms across the region and demonstrated that there are many factors that affect winter grazing outcomes.

An army of volunteers supported the data collection and became passionate advocates for rallying the farming community to talk about practices and good management.

With 500 soil types, and combinations of soil types, in Southland, the study considered whether soil type influences land suitability for winter grazing.

The study used surface pooling and gumboot scores as measures to indicate stock comfort and found that even a small amount of rainfall can change the soil from wet to sodden.

Large volumes of data were gathered on crop yields and establishment methods. On commercial farms, data was primarily collected on soil characteristics before and after grazing, the crop yield, and other aspects of each establishment method.

On some properties additional measurements were taken, such as post grazing crop residuals and visual soil assessments once paddocks had been replanted. Farmers completed daily observations of livestock grazing the treated paddocks and data was referenced against weather events.

The most significant learning was that the daily management of grazing stock had the greatest impact on soil damage, rather than soil type and crop establishment methods. Although soil type did appear to influence the occurrence of surface water pooling, pugging and compaction risk.

It highlighted that having a winter grazing plan, with planned crop husbandry and stock management, supported the best wintering successes. Farmers who carefully assessed their own situation, adapted what they did as conditions changed, and had good systems in place, had the best outcomes.

However, the study also found that there was no silver bullet, and there was no clear 'best alternative' to conventional cultivation. It found that although lower yields reduced the stocking density in a given area, regulatory limitations on the proportion of the farm that can be used for winter grazing actually favours intensification. This puts pressure on farmers as they try and support sustainable agriculture, striving for high crop yields and simultaneously protecting soils.

Different crop establishment methods

The study found that you get out what you put in. Yields were relative to the amount of time, effort and expenditure spent on crop establishment. It found that with careful thought and preparation, many outcomes, including feed security and animal welfare, improved.

Although low or no till options may appear to be more environmentally sustainable (from a carbon and soil structure perspective), observations from this study were of lower yields, greater weed burdens, and increased pest pressure. An unintended consequence of minimal/low till establishment was the increased need for chemical weed and pest control to help achieve a more sustainable yield.

The study at the Southern Dairy Hub found that for crop establishment, there were differences in yield for the fodder beet crops with direct drill and strip till compared to conventional cultivation. For example, areas established by direct drill and strip till were weedier even when Italian ryegrass was sown following the crop.

The pilot study also observed that there were several sites that had some surface pooling - but correlations between treatments couldn't be made and would be an opportunity for further research.

The data collected on the commercial farms was variable, and the thousands of photos and observations collected gave a unique picture of day-to-day conditions. Overall, observations indicated animals behaved contentedly for the vast majority of the time regardless of crop establishment method.

WHAT FARMERS CAN DO:

Farmers need to carefully assess their own situation, change what they do as conditions change, and have systems in place to support the changes – ultimately good management of their crops and stock was the main factor that impacted soil conditions and mud creation.

The study found that the following four steps would make the biggest improvement to wintering outcomes:

1 Implementing Good Management Practices to maximise the time animals spend in better conditions (unless it's continuously wet)

2 Having a Plan B and those on the ground knowing when to implement it.

3 Good paddock preparation and agronomy practices to achieve optimum crop yields.

4 Utilising portable troughs and back fencing.

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