Soil Compaction Reduces Grassland Yield

The Challenge

A recent survey of grassland farmers indicated that 70% of fields had moderate or poor soil structure.

This will have some impact on crop yield and if there is a reduction in yield additional land or more bought in feed will be required, incurring greater cost.

Quantifying the cost of compaction on farm will help support any decision to minimise risk or alleviate the damage. Better understanding the consequence for soil structure could also support nutrient management and reduce field run-off.

The Research

Plots at SRUC Dairy Research and Innovation Centre were compacted in the autumn of 2011, 2012 and 2013 either by cattle trampling or tractor driven traffic and compared to areas of no compaction.

Three silage cuts were taken in the year following each compaction. Dry matter yields were compared over three years to assess the effect of compaction on yield.

Damage to the soil structure was also visually appraised as well as physical measurements by penetrometer and of the soil bulk density.

The Results

The research found that compaction of the soil by tractor or cattle trampling can reduce annual yields by up to 14% and 11% respectively.

The first cut of grass silage, after exposure to compaction the previous autumn, showed the greatest reduction in yield, up to 37% for tractor compaction and 19% for the trampled area.

The reduction in first cut dry matter yield was seen in all three years of the trial, with a mean reduction of 19% for the tractor compaction and 14% for the animal trampled areas.

The Impact

Quantifying how soil structure impacts yield will help encourage and guide preventative measures on farm.

Success through Knowledge Knowledge Transfer and Exchange Programme (supported by the Scottish Funding Council, SFC).

Project Detail

Project start date: 10/2011, finish date: 10/2014.

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For further info http://dairy.ahdb.org.uk/research-development/soils/current-projects/

http://dairy.ahdb.org.uk/resources-library/technical-information/grass-management/healthy-grassland-soils-guide/

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Further Information

For more information or to discuss soil assessments and supporting nutrient management plans contact your local consultancy office or visit **www.sruc.ac.uk**

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