

GROW MORE GRASS WITH DIGEST-IT TREATED SLURRY

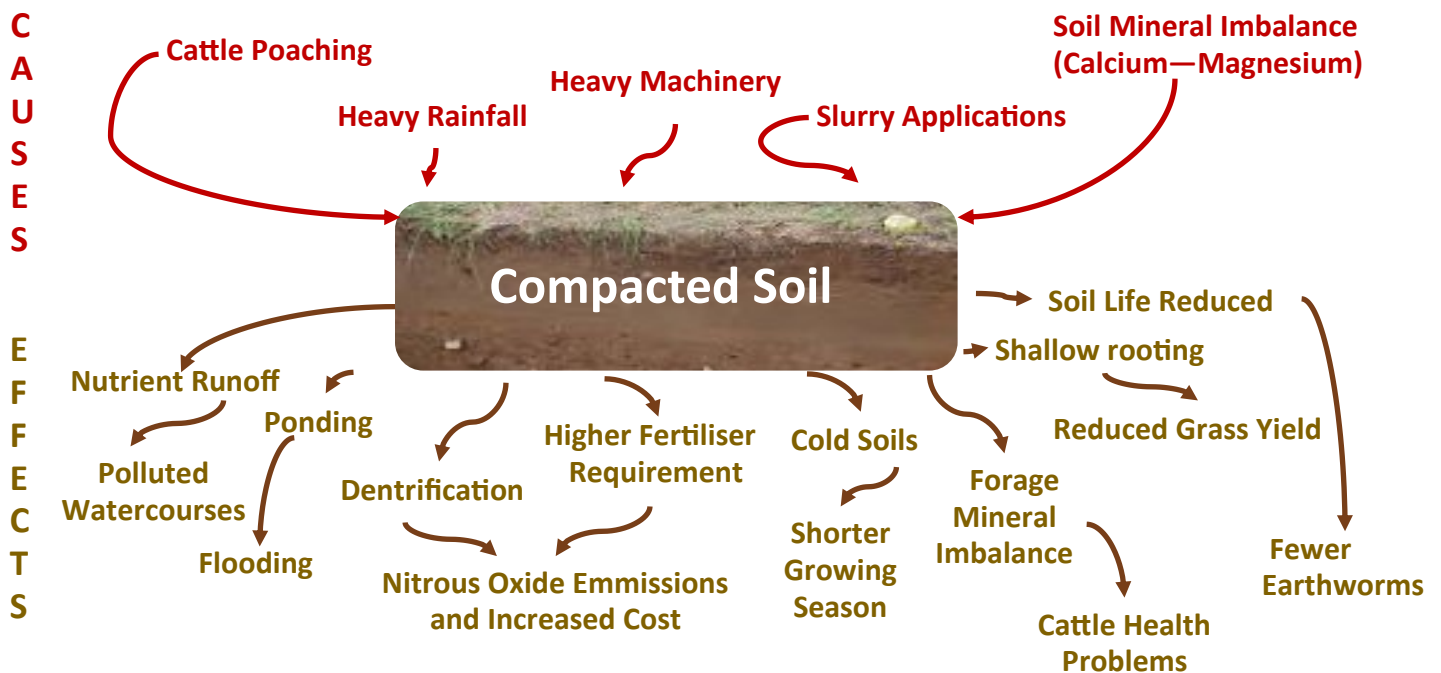
GRASS—KEY TO DAIRY PROFITABILITY

G rass is the cheapest food source for dairy cattle and has the biggest positive impact on profitability. Increasing Utilisable Grass Dry Matter yields by 1 tonne/ha raises net dairy profitability by €173/ha (Teagasc, 2017). The average Irish dairy farm is producing about 7.5 tonnes DM/ha, while the top producers achieve over 12 tonnes DM/ha. This difference equates to an additional Net Profit of €779/ha.

COMPACTION—REDUCES GRASS GROWTH

The key to growing more grass is improving soil health, which means bringing life back into soils. Life exists in multitudinous forms, ranging from microscopic bacteria and fungi to mighty earthworms. All life is interdependent and plays an important role in releasing nutrients from soil reserves in support of grass growth. Mycorrhizae fungi are particularly important for building stable soil structure, reducing Nitrogen leaching and creating humus.

Compaction is the single most significant threat to growing more grass and can reduce yields by up to 40%.



CAUSES

Some of the causes of compaction are well known, such as Cattle Poaching and Heavy Machinery. Less well known is the effect of Heavy Rainfall (short, sharp showers), Slurry and Soil Mineral Imbalances.

Slurry contains Nitrogen, mainly in the form of Ammonia, which provides its distinctive odour. Ammonia destroys soil structure and over time will cause compaction. In the past, ammonia was used in civil engineering to create hard soils in preparation for building roads and airstrips.



EFFECTS

The main effect of compaction is reduced grass growth, but there are many other consequences, including:

- 2.5 X more Nitrogen fertiliser to grow grass
- Shorter growing season
- Grass feeding quality is reduced
- Less soil life

and also adverse environmental consequences including:

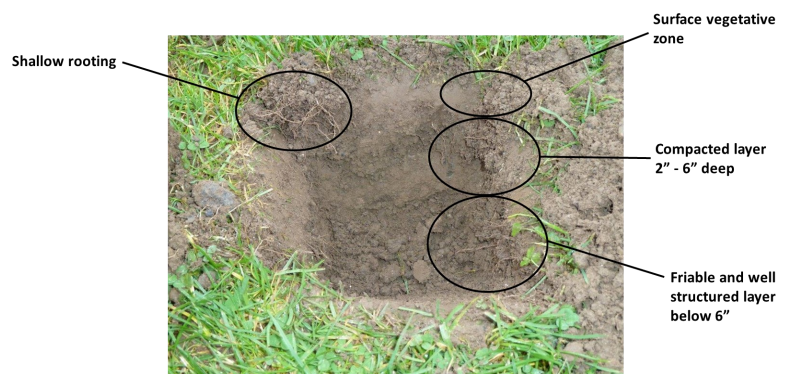
- Increased risk of nutrient run-off into water courses
- Flooding
- Higher Nitrous Oxide emissions (Greenhouse Gas x300 more potent than Carbon Dioxide)

But the single most important effect of compaction is to **kill off soil life**.

Three inputs are essential for soil life: **AIR** **WATER** **FOOD**

Food and water are rarely limiting, it is COMPACTION squeezing **AIR** from the soil and suffocating soil life, that is the greatest threat.

The only way to check the depth and extent of compaction is to DIG A HOLE.



SOIL IMPROVEMENT PLAN

Soil has three distinctive fractions: **PHYSICAL** **CHEMICAL** **BIOLOGICAL**

all of which play a role in compaction. The **SOIL IMPROVEMENT PLAN** has been developed to tackle each of these fractions.

PHYSICAL (Soil) - AERATION on a regular basis (spring and autumn) to disrupt surface compaction, improve surface drainage, encourage rooting and allow AIR penetration in support of soil life.

CHEMICAL (Nutrients) - SOIL TEST, including Teagasc test for lime and available Phosphorus and Potassium, but also measuring Organic Matter and Calcium and Magnesium balance which is important to building a stable soil structure.

BIOLOGICAL (Life) - AEROBICALLY DIGEST SLURRY with DIGEST-IT, a microbial composting agent, to improve fertiliser nutrient status, reduce Ammonia and switch the microbial balance away from Anaerobic (putrid and smelly) to Aerobic, with good AIR breathing bacteria which are an important part of soil life.



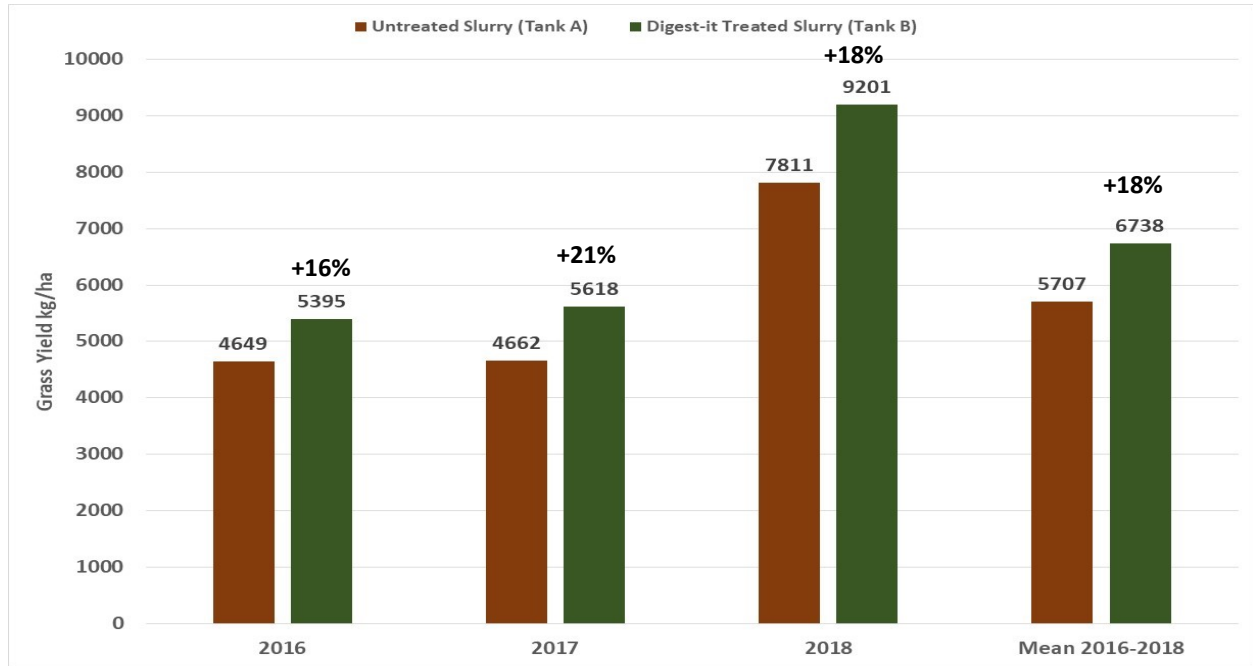
GRASSLAND TRIALS—DIGEST-IT TREATED SLURRY

A key component of the SOIL IMPROVEMENT PLAN is the aerobic digestion of slurry to provide the same life-giving properties as well-rotted dung. Grass trials have been conducted on a dairy farm in Co. Meath, on a highly productive silage field (12 tonnes DM/ha/year) which, on soil analysis, had a satisfactory lime status, available P and K levels and mineral balance.

The main cattle shed has two slurry tanks, one of which was treated with DIGEST-IT (1 litre per 22.7m³ slurry).

Untreated and DIGEST-IT treated slurry were applied onto trial plots at 2000 gallons/acre. First cut silage DM yields were then recorded in both May 2016, and 2017 and June 2018.

1st Cut Silage DM Yields on Untreated and Digest-it Treated Slurry



* All trial plots received 2000 gallons/acre slurry and 3 bags CAN.

Ref: Devenish Nutrition

DIGEST-IT Treated Slurry increased 1st Cut Silage DM yield by 746kg/ha (+16%) in May 2016, by 956kg/ha (+21%) in May 2017, and by 1390kg/hg (+18%) in June 2018, compared to Untreated Slurry from the same group of dairy cows.

GRASSLAND TRIALS—ECONOMICS

The Net Economic Benefit of DIGEST-IT Treated Slurry vs Untreated Slurry is shown below:

	May 2016	May 2017	June 2018	Mean 2016-2018
DIGEST-IT Extra DM/ha (kg)	+746	+956	+1390	+ 1031
Net Value of Grass DM/tonne	€173	€173	€173	€173
Extra Grass Net Value/ha	€129.00	€165.00	€241.00	€178.00
DIGEST-IT cost/ha	€15.00	€15.00	€15.00	€15.00
Additional Grass Net Value/ha	€114.00	€150.00	€226.00	€163.00
Cost Effective Ratio	8.6:1	11.0:1	16.0:1	11.9:1

The Net Value of the extra Grass from the DIGEST-IT treatment has been valued at €173/tonne, which is the Teagasc (2017) figure for the value of grass fed to dairy cattle. In 2016, an additional Net Value of €114 per ha was generated, €150 per ha in 2017 and €226 per ha in 2018. This equates to a cost effective ratio of 8.6:1 in 2016, 11.0:1 in 2017 and 16.0:1 in 2018 when the cost of DIGEST-IT is accounted for. Over the period 2016-2018, the average additional Grass Net Value was €163/ha, which is equivalent to a Cost Effective Ratio of 11.9:1 once Digest-it costs have been taken into account.



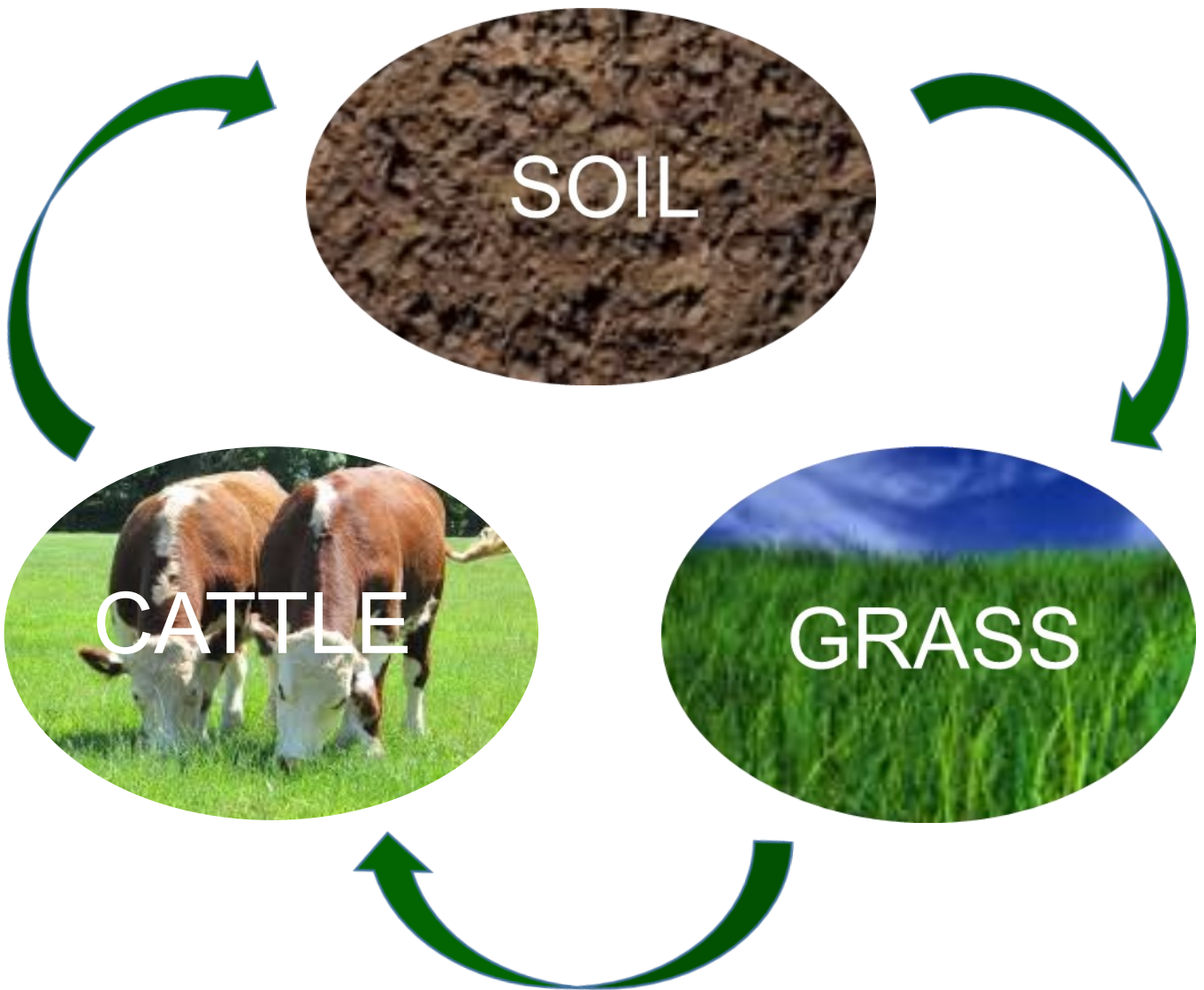
SUMMARY

Increasing Grass Yields is the most important economic driver for dairy cattle profitability.

Soil compaction represents a major constraint to growing more grass.

Introducing a SOIL IMPROVEMENT PLAN designed to REDUCE COMPACTION and BUILD SOIL LIFE is the most effective strategy for GROWING MORE GRASS.

Aerobically digesting slurry with DIGEST-IT, as part of the SOIL IMPROVEMENT PLAN, has been shown to increase 1st Cut Silage DM Yields in 2016, 2017 and 2018 at an average Cost Effective Ratio of 11.9:1.



HEALTHY SOILS

HEALTHY GRASS

HEALTHY CATTLE

