Optimising Tractor Fuel Use

Practical Guide

Under the Scottish Climate Change Act (2009), Scotland is committed to reduce greenhouse gas (GHG) emissions by 80 per cent by 2050. This stretching target sets the pace for change, with agriculture playing a significant role.

All regular farm fuels like diesel and LPG are fossil derived, and release stored up carbon in the form of CO_2 whenever they are burnt.

Each litre of diesel burned results in the emission of around 2.6kg of CO_2 to the atmosphere.

Although CO_2 losses usually make up just a small percentage of a farms overall emissions, making best use of fuel can still help to reduce the farm carbon footprint and could lead to significant savings on the fuel bill and improve farm profitability.

This Practical Guide looks at how to reduce tractor fuel consumption

Top Tips for EVERY farm . . .

- Ensure that the appropriate tractor is used for the job
- Minimise field tracking by confining vehicles to permanent tramlines or defined routes as much as possible
- Look for low CO_2 emissions or low specific fuel consumption when replacing farm vehicles
- Ensure vehicles are regularly serviced – poorly maintained vehicles have higher toxic emissions and fuel consumption
- Throttle down - gear up. Keep revolutions as low as possible, this could save 33% on fuel cost
- Ensure the correct tyre pressure is used
- Plan work to minimize journeys
- Consider minimum tillage

Farming for a Better Climate

There are five sets of Practical Guides covering :

Use energy and fuels efficiently

Develop renewable energy

Lock carbon into soils and vegetation

Optimise the application of fertilisers and manures

Optimise livestock management and the storage of manure and slurry

Find further information, including links to other Practical Guides and Case Studies, at

www.farmingforabetterclimate.org

Funded by the Scottish Government as part of their Climate Change Advisory Activity

Websites

www.farmingforabetterclimate.org

www.farmingfutures.org.uk

www.ipcc.ch

www.soilassociation.org.uk

www.renewableenergyonfarms.co.uk

www.agrecalc.com

www.calu.bangor.ac.uk/energybooklet.php.en

www.energysavingtrust.org.uk

www.carbontrust.co.uk

www.controlledtrafficfarming.com

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Optimising Tractor Fuel

Use the right tractor

Make sure that the size of tractor is appropriate for the job in hand. Correctly matching your tractor and implement will allow efficient operation, saving you money.

Some operations require high powered machines. Where these operations are limited, it may be more efficient to hire a tractor or use a contractor and retain a more fuel efficient tractor in your fleet.

Leaving a tractor idling for extended periods wastes fuel and creates unnecessary emissions. It is important to maintain your tractor so that it starts promptly and efficiently.

Stop/start technology is now fitted to many cars to save money, with regard to fuel use and the release of CO_2 emissions. Similar savings are possible by ensuring that your tractor can stop and start efficiently.

Reduced tillage

Direct drilling uses around 12 litres of fuel per hectare while ploughing, sowing and cultivating consume 60 litres/ha.

Changing to minimum tillage practices could reduce fuel use as the consumption lies mid-way between these figures.

Correct tyres and pressure

Attention to tyre maintenance can save fuel, not only on the tractor but by avoiding compaction which may require further implement passes to eradicate.

- Bigger tyres at a lower pressure lead to less soil compaction and less slipping, which is more fuel efficient.
- Check tyre pressures - Tyre tables will give correct pressures based on the weight on the tyre and working speed. If you do not know the weight, as a guide, 3 tread bars should be in contact with the ground for correct pressure.

Tractor maintenance

Regular tractor maintenance is important to maintain power output, and to keep fuel use to a minimum.

- Ensure the air cleaner is debris free or power output could be reduced by 30% and fuel wasted.
- Make sure that your fuel is clean. If fuel is contaminated the fuel pump and injectors will not work efficiently.
- Do not leave fuel lying idle for more than 6 months; biofuel additives in diesel can lead to sludge forming which causes blockages when you come to use the fuel. Combines in storage may suffer from this problem.
- Make sure that the correct oil is used and changed regularly so the engine runs smoothly.

By 2015 off road vehicles will need to comply with tier 4 standard emission regulations. To reach these standards two principle methods have been developed by engine manufacturers.

- Exhaust Gas Recirculation (EGR) where combustion temperature is reduced by re-flowing some gas emissions back to the inlet air which results in less nitrogen oxides being released
- Selective Catalytic Reduction (SCR) breaks down nitrogen oxides by using a diesel exhaust fluid (DEF) also known as AddBlue

SCR uses less fuel than EGR, however, you do need to include DEF to the running cost. EGR is used by Deutz and John Deere, whereas AGCO (MF, Fendt, Valtra), CNH (New Holland and Case IH) use SCR.

Key Fact — Field compaction costs money by reducing crop yield and also by incurring additional tillage costs to remedy. Combination implements reduce passes and hence compaction risk.