Factsheet

Small measures can make big fuel savings

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The last year has seen unprecedented inflation in some key agricultural inputs and recent events has seen prices for red diesel (gas oil) spiralling over the spring and early summer.

As we enter one of the busiest times of the year for both arable and stock farmers alike, there are a number of very simple measures that operators can undertake to help improve fuel efficiency. With fuel prices as they are now - saving even a few percent can translate into a decent financial saving for a farming business. For example, typically it takes around 100l/ha to produce a hectare of cereals, varying with crop, system, soil and field size - at 50p/litre this equates to £50/ha, current levels would see this rising to over £125/ha. For a 6.25t/ha (2.5t/acre) crop this increases production cost by over £12/ton. The livestock sector will also see similar increases in the cost of production of fuel intensive crops such as silage.

Looking at this another way, the table below shows how fuel costs will change for different levels of usage for a typical tactor using on average 15l of fuel/ hour assuming a mix of light, medium and heavy work.

Annual Hours	Fuel used per annum @15l/hour	Fuel price (p.p.l)			
		50	75	100	125
500	7500	£3750	£5625	£7500	£9375
1000	15000	£7500	£11250	£15000	£18750
1500	22500	£11250	£16875	£22500	£28125

While the increased costs will have an impact on profitability, the effects on cash flow also need to be considered. With fuel bills at least double that of last harvest, extra strain will be applied to bank balances and overdrafts, at a period when cash can be tight in the best of times, just before money is received for grain sales. This will be exacerbated further if it is a wet harvest and movement is slow, forcing farmers to dry more to preserve quality.

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Maintenance and set up

Time can be at a premium with the weather sometimes making land work either later than ideal or indeed a very stop-start affair.

We live in a “plug in and play” world, expecting that everything is ready to go and perhaps the farming equivalent could be “jump in and get on with the job” with time pressures meaning that settings and maintenance may not get the same attention - all to get the task completed as quickly as possible.

Setting up machinery properly

Spending time setting up machinery correctly, particularly soil working equipment and surfaces, can help make sure they are working at their optimum and most efficient. This includes making sure equipment is level both from front to back and left to right when working and that linkages are set correctly. Operators should be fully aware of how to get the best from machines and crucially know how to set them up correctly. They should also be able to make any required adjustments to take account or even advantage of changing conditions.

Keep tractors and machinery well maintained

Maintenance should also be kept up to date. This starts from the basics such as regular greasing and lubrication but also extends to making sure that items such as filters (from air, oil, fuel and even air conditioning) are working as efficiently as possible and warning messages are heeded. Operators manuals should be adhered to at all times when undertaking servicing and regular maintenance. Remember clean fuel and plentiful air are vital for modern engines to work as efficiently as possible.

Regular maintenance of machinery is also important to ensure most efficient performance. Once again manufacturers instructions should be followed in terms of regular operator maintenance but it’s also important that even simple daily checks are undertaken such as the sharpening of blades on forage harvesters or balers, to changing plough metal when required. Whether it is blunt blades or points, the quality of the job will suffer and worse, more diesel is required as tractor revs are increased to compensate.

Bigger self-propelled machinery should always get their pre-harvest checks from dealers - they should have the software and knowledge to potentially identify any faults and wearing parts that need replaced. Avoiding downtime so that you can harvest when the weather and crop is ideal is important- any breakages may mean you end up playing catch up- having to work longer hours, with higher moistures leading to quality issues and more fuel consumption through increased drying and carting, with combines also put under extra strain. By the same token, grain driers should also be cleaned out thoroughly so that airflows can move as efficiently as possible. In addition burners should also be serviced so that they too can operate efficiently, reaching desired temperatures with the minimum fuel.

Use the right tractor and weights for the job and consider your tyres

Matching tractors for the job in hand is important- while the 300 hp main tractor may be best for the one-pass, there is probably a better choice for following behind with the rollers. An oversized tractor will use more fuel to complete a task so choosing an appropriately sized tractor is a simple way to optimise fuel efficiency. Weight or ballasts can play an important role in making sure a tractor can pull an implement effectively or operate safely, however excessive or unnecessary weight for a task puts more strain on the tractor engine and wastes fuel.

Tyres can also play an important role in fuel consumption. Operators should look at adjusting pressures according to the task although again, it comes down to the skill and judgement of the operator, and tyre manufacturers guidance should always be followed. Lower pressures will increase fuel use however should be considered for field work to minimising sinking, wheel slip and compaction where necessary. If a tractor is used mainly for road work, then a higher pressure is required to be as fuel efficient as possible. While some tractors are fitted with inflation systems to allow these changes in the field, for most growers even simply reducing tyre pressures for sowing and then putting some air back in for silage carting would help get the best of both tyre performance and fuel efficiency.

Don’t be an aggressive driver - be a smart one and let the tractor do the thinking!

How the operator drives can significantly affect fuel consumption, although technology can help and operators should take advantage of this where possible. Some modern tractors benefit from continuously variable transmission systems whereby the engine management system will automatically change gears to achieve the optimum engine performance and fuel efficiency. In a similar way other tractors will have an economy or Eco setting which operators can engage for better fuel efficiency. Using technology in other ways can also aid fuel efficiency, such as using headland management systems or even GPS to plot the most efficient way to work a field and prevent over and underlapping of passes. Taking this a stage further the fitting of hydrolysers to diesel engines has been found to reduce consumption. While this may cause issues with warranties in newer machines, their fitting to older high use vehicles (e.g. loader tractors on a livestock farm) may be justified.

Driving at unnecessary high engine speeds, accelerating too fast and braking hard is not good for the tractor and results in increased fuel consumption. To achieve maximum fuel efficiency, operators should always try to keep engine speeds as low as possible without unduly labouring the engine, and drive smoothly. Operators should try to shift up the gears and reduce engine speed where possible particularly when undertaking PTO work. Some tasks are more demanding than others, however the 540E setting should be used where possible.

Have patience and think about how you do things

There can always be the temptation to work the land too soon, particularly in years with poor weather. Working a field a couple of days too early will require more energy, using much more fuel and in many cases leaves a substandard seed bed, ultimately resulting in a poorer crop.

In the same way, silage is mostly water. While quality undoubtedly needs to be maintained, growers should think about how long they can wilt the crop. The longer it can be left to wilt without sacrificing quality, the more water is left in the field and the less water that is unnecessarily carted about- reducing the fresh weight to be transported and subsequently reducing the fuel requirement.

It is also worth taking the time to think about grain harvesting practices and logistics. The use of pre-harvest desiccants can help even up a crop and tidy up grass weeds, reducing overall moisture and aiding harvesting. However in addition to being an extra cost and pass, applications must be applied in a safe manner (particularly near sensitive crops) and end users terms must be considered. In addition applications must be made at the correct stage of crop development to prevent damage or reductions in quality. For livestock farmers the use of preservatives may be an option, again there is a cost in terms of the product and also processing but some of these can also help improve protein content, adding more value. Most farms now have much more combine

capacity than in the past, while the temptation can be to cut whenever possible and get finished as soon as you can, in most years showing some restraint and starting a bit later and finishing a bit earlier will see moistures at their optimum level. This also makes the drying process much easier and constant without wetter loads having to be blended through.

Monitor and record

Farmers should also record usage - a simple way is to have a notebook at the tank and usage can be measured by noting how much is required to fill the vehicle on a brim to brim basis while noting the tasks undertaken and tractor hours. This can be used to find out -

- what tasks use most fuel
- any differences between similar machines
- or even the differences between operators.

Where there are differences, this allows further analysis- even comparing fuel rates for different fields can be helpful. Differences between similar machines may suggest that one machine may need further investigation- this could range from changing filters to tweaking the engine management system for better performance and fuel efficiency. Where there are differences between operators, is more training required for the individual? Is it an issue with the machine or are they having to do tasks with the wrong sized tractor?

Ultimately if you don't measure - you don't know if something can be improved and make evidence based decisions. Making small changes to machines and driver habits could bring big savings in the months ahead.