Smart Farming

A Guide to Help Improve Farm Returns with Better Resource Management

Fertile soils are essential for grass and crop growth. These top tips will help you save money and protect the environment by better matching fertilizer and nutrient use with crop requirement.

Soil testing could save you up to €23/acre!

By soil testing, you can save €23/acre on fertilizer [1]

This is on land with high P and K levels (Index 4) and stocked at 2 dairy cows/ha (0.8cows/acre)

Consider soil testing at least every five years. It's an indicator of soil fertility levels.

Soil testing can save you money by identifying what parts of your farm have low fertility and need extra fertilizer to improve productivity. Soils with higher fertility need less fertilizers.

It will also help to plan fertilizer, slurry and manure spreading.

The annual cost of soil sampling is roughly 50 cents/acre/year [2]

This is the same cost as 0.5 units/acre of P fertilizer

Apply lime - it could save you 2 bags/acre of CAN! [3]

Low soil pH will result in:

1) lower availability of the nutrients in the soil, and

2) poorer response to applied fertilizers

Lime neutralises acidity in the soil and makes nutrients available to grow crops.

Spreading lime where required should be a priority after soil testing.

The soil test report will show a ''lime requirement'' result to indicate the rate of lime required to increase the soil pH to the correct level.

Optimum pH for grassland is 6.2-6.3 and tillage is 6.4-6.5.

Don't over lime. It can lead to trace element imbalances. Don't apply more than 7.5t/ha (3 t/acre) in a single application.

Avoid applying lime on fields with a lot of grass cover. After silage harvest or grazing is an ideal time to spread lime.

Lime can be spread all year round.

Building soils to Index 3 could be worth €180/acre [4]

€ **Soils with P Index 3 will yield more grass DM than a soil in P Index 1. Approximately 0.6 t/acre (or 1.5t/ha)**
This extra grass could be worth approximately €180/acre.

Soil Index 3 is the target soil fertility for grassland and most tillage crops.

Plan fertilizer and slurry applications so that all fields can be maintained in soil Index 3. Aim to replace the nutrients being removed in crops.

Know your soil index, so that the correct fertilizer rates can be applied.

The Soil Index System

What does "Soil Index" mean?

The soil Index system takes soil test results and simplifies them to show if a soil is either, low, medium or high in fertility for each nutrient. The soil test report shows the ''soil Index'' for each nutrient. The Index is given as a number: either 1, 2, 3 or 4.

Index	Description	Action required
1	Very low	**Sub-optimal fertility.** Apply fertilizers to increase soil fertility levels as well as to feed the grass or crop.
2	Low	
3	Medium	**Optimum fertility level.** Aim to maintain soil in Index 3. Apply fertilizers to replace the nutrients removed by crops or animal produce. Only approximately 25% of soils are currently in Index 3.
4	High	**High fertility level.** Soil has more nutrients than required to grow the crop. Additional fertilizers are usually not required, as the soil nutrients are sufficient to feed the crop. The risk of losses to water is also increased.

Index 1 and 2 soils (low fertility) will be underperforming and need to be improved by applying fertilizers.

Index 4 soils are a resource on your farm. Exploit them and save money on fertilizer.

A field might be Index 3 in one nutrient, but be low or high in another nutrient. Look at the requirements for each nutrient in each field individually.

Manures and slurry are valuable sources of nutrients.

€ Slurry spread efficiently could save you €27 per 1000 gallons

Think about the nutrient value of manures produced on the farm in terms of a 50kg bag of chemical fertilizer:

Manure type	Units			Value [5]
	N	P	K	
Cattle slurry (1,000 gals)	6	5	38	€ 27
Soiled water (1,000 gals)	4	0.7	5	€ 5
Pig slurry (1,000 gals)	19	7	20	€ 27
Farmyard manure (1 tonne)	3	2.5	12	€ 10
Broiler litter (1 tonne)	11	12	24	€ 30
Spent mushroom compost (1 tonne)	3	5	18	€ 16

If you are spreading slurry – ask yourself:

"Would I be spreading bag fertilizer in this field if I wasn't spreading slurry?"

If the answer is no, then the slurry is not saving you money on fertilizer!

Use slurry more effectively to save on fertilizer costs and to reduce losses to the environment.

Consider sourcing manures and slurry from other farms to save on fertilizer costs.

Spreading manure and slurry – Two Simple Questions:

1) Where to spread? 85% of the value of slurry comes from the P and K. Identify fields that have a requirement for the P and K in the manure/slurry.

2) When to spread? During the *open* season when losses of N to air are at their lowest (lower temperatures, moist weather). Spring is ideal!

Nitrogen availability in manures is highly affected by weather conditions in the 24 hours after application.

€ Target cool moist conditions to reduce nitrogen losses to the air. Aim for spring application. Cattle slurry applied in spring is worth €1.80 more per 1000 gallons than slurry spread in summer

Where feasible, band spreader, trailing shoe, and injection application methods also improve the N availability after application.

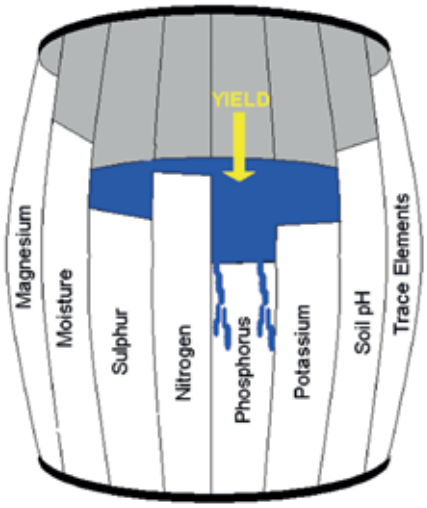
Use compound and straight fertilizers to balance requirements

What is meant by a "compound" or "straight" fertilizer?

Compound fertilizers (also called NPK fertilizers) are mixtures of nutrients, usually N, P and K. The name of the compound reflects the % of N, P and K in the product. For example, 18-6-12 contains 18% N, 6% P, and 12% K. A 50 kg bag of 18-6-12 will supply 18 units of N, 6 units of P and 12 units of K.

Straight fertilizers contain only one nutrient. Examples include CAN (27% N), Urea (46% N) and Muriate of potash (50% K).

Fertilizers should supply nutrients in the correct balance for the crop and the soil fertility level



The grass or crop yield will be limited by the nutrient in the shortest supply. Excess application of one nutrient is wasteful if yield is being restricted by another nutrient and also increases the risk of runoff to water with the potential to cause water pollution.

Think of it as a barrel of water where each plank is a nutrient and the water level is the yield. The level of water can't get higher than the shortest plank in the barrel, no matter how high the other planks are!

Consider using a variety of fertilizer types that suit your farm. Straight chemical fertilizers may be more suitable than compounds in some circumstances.

For example, if a field is very high in soil P fertility, straight N and K fertilizers or a compound fertilizer with no P would be a good choice to meet the N and K requirements without spending on unnecessary P.

Remember fertilizer is not just a product in a bag!

Other sources of nutrients that can fertilise your grass and crops include nutrients in the soil, in manures and in slurry.

These should be managed to ensure that all nutrients on the farm are recycled as efficiently as possible, and that the money you pay for chemical fertilizer is money well spent!

Footnotes

1. Soil tests could save €23/acre if a field is identified as being in Index 4. In the absence of a soil test, P and K advice at Index 3 for a sward grazed by dairy cows stocked at 2 LU/ha would be 11 units/acre of P and 24 units/acre of K. Based on a P and K fertilizer cost of €1/unit for P and €0.50/unit for K, the cost of applying the full P and K requirement at Index 3 would be €23/acre. At Index 4, no P and K are required therefore €23/acre could be saved. The potential savings are lower (€14/acre) on a drystock farm, as the P and K requirements are lower.
2. Soil tests will cost 50 cents/acre/year based on a cost of €25 per sample, for an average area of 10 acres per sample taken every 5 years.
3. Additional N is released from soils that are optimum pH compared to soils that are low pH and require lime. The additional N has been estimated to be over 50 units/acre/year. This is equivalent to approximately 2 bags/acre/year of CAN.
4. The grass DM yield potential of Index 1 soils is estimated to be 1.5 t/ha (0.6 t/acre) lower than soils in Index 3. Assuming that 1 tonne of grass DM can offset 1 tonne of concentrate feed costing approximately €300/t, the value of the extra grass grown in Index 3 compared to Index 1 could be worth €450/ha (= €180/acre).
5. The value of manures is based on the available nutrient content in each manure and the cost of chemical N P and K fertilizer. Values are calculated based on approximate chemical fertilizer costs for N (€0.60/unit), P (€1/unit), and K (€0.50/unit).

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Energy is a significant cost on most farms. However energy bills can be reduced by up to 30%, often with minimal capital outlay [1].

Here are some top tips to help you reduce your energy bill.

Know your energy use

Identify the major areas of energy demand around the farm. Check the condition and operation of equipment and monitor power consumption over a period of time, for example one week.

How does your electricity use compare to the average use figures in the table below?

Production system	Average cost of electricity per unit of production
Dairy [2]	0.49c /litre of milk
Pigs	€5.40/head/year
Poultry	0.1c/bird/year
Grain drying [3]	€12.3/ tonne

Identify where energy is used, assess and take action

Compile an energy checklist for your farm by walking around your buildings at different times of the day and seeing where energy is used. Check on building insulation, lighting, heating systems, pumps, ventilation, water heating and milk cooling.

Insulate Farm Buildings Adequately

€ **Upgrading loft insulation in the family home from 100mm to 300mm will save €250 a year on a typical bill of €1600** [4]

Farm buildings including the farm house vary greatly in age, use and construction materials. The construction (in terms of air-tightness) and insulation of these will determine the overall energy consumption. Upgrading the insulation in your home and in heated buildings such as pig and poultry units will reduce your energy costs.

€ **Upgrade insulation on electric hot water tank will save €130/year** [5]

Correct Lighting – Can Reduce Your Cost by 50%

Lighting is one of the easiest areas where savings can be made. Lighting costs can be reduced by up to 50% [6] by providing the right amount of light, in the right place at the right time with effective lighting equipment.

Light efficiency is measured in lumens per watt. The higher the lumens per watt the greater the lighting efficiency.

€ **Replace the 500 watt halogen flood light with an equivalent light output 150 watt High Pressure Sodium lamp**

It will save €128 /year and it lasts 10 times longer! [7]

For yard lighting, High Pressure Sodium lights are best. They offer a balance between colour rendering and high efficiency

They should be controlled with a dawn to dusk sensor and time switch

Think about safety and pay attention to the suitability of fittings for the humid, dusty and warm environments often found in livestock and poultry buildings.

The new energy efficient standard is the T5 fluorescent tube with dimmable electronic ballast, mounted in weather-proof housing (plastic)

€ **Replace older T12 fluorescent tubes with T5 tubes using a new fitting or a conversion kit for your existing fitting and save €17/year/tube** [8]

Heating and hot water - fixing a small leak of 1 litre/hour can save you up to €760/year[9]

€ A regularly serviced farmhouse boiler can save as much as €160 on a typical annual heating costs of €1600 (SEAI)

€ A modern new household boiler e.g., a condenser boiler can reduce energy bills by 25% and save €400/year (SEAI)

In the farmhouse: set your thermostat as low as is comfortable, check your timers, bleed radiators and service the boiler annually. If the temperature setting is out by just 1°C, it can mean an increase in energy consumption of 15%[10]

On a dairy farm to save money on water heating ensure that all pipes and tanks are well insulated, minimise the distance that hot water has to travel and use night rate electricity. Make sure that timers are set for the right time and are keeping time.

Milk Cooling[11]

€ Correctly sized Plate Heat Exchangers can reduce the energy costs for cooling milk by up to 50%, which can give a saving of €9/cow/year

Milk needs to be cooled from 37°C down to about 4°C. Milk cooling costs are typically 40% of overall costs of milking. Pre-cooling is achieved by passing the hot milk through a Plate Heat Exchanger (PHE) before entry to the bulk tank. Cold water is pumped through the opposite side of the PHE. The cold water absorbs a portion of the heat, thus pre-cooling the milk and contributing to hot water supply.

€ Use of water to pre-cool the milk before it enters the tank will save about 30% of milk cooling costs – an energy saving of €5/cow/year[12]

Vacuum Pumps

€ Install a variable speed drive to the vacuum pump in the milking parlour. It can give you a 60% reduction in pump running costs, equivalent to €4/cow/year

Consider installing a variable speed drive (VSD) to a vacuum pump. It can result in savings of over 60% on vacuum pump running costs per year[13].

Ventilation

Energy savings can be made on ventilation systems through better controls, more efficient air movement and less reliance on mechanical systems. The careful choice of fans, the design of ducts, regular maintenance and cleaning reduce the energy costs and improve efficiency.

23% of energy use in pig farms is for ventilation

€ A 40% improvement in energy efficiency can be achieved through more effective control and routine maintenance of the ventilation system. This has resulted in savings of €4/finished pig/year in an integrated unit.[14]

Footnotes

1. ADAS. Managing Energy and Carbon – the farmer's guide to energy audits. ADAS, UK.
2. Figures for Dairy, Pig and Poultry sourced in Teagasc 2011, Energy Use in Agriculture. Teagasc Oakpark, County Carlow.
3. Natural England. 2008. Natural England Carbon Baseline Survey Project. Natural England. UK.
4. Figures from Sustainable Energy Authority of Ireland (SEAI) based on a four bedroomed detached house see http://www.seai.ie/Grants/Better_energy_homes/homeowner/What_Grants_Are_Available/Ceiling_Level_Roof_Insulation_Information.pdf
5. Based on reinsulating a 200 litres water tank heating water from 14°C to 80°C on night rate electricity (10c/kWh) where insulation has deteriorated.
6. Sustainable Energy Authority of Ireland – Exterior Spaces Lighting Guide.
7. Changing from a 500watt halogen flood light to an equivalent light output 150 watt high pressure sodium lamp; savings= 350wattx10hrs/dayx365days = €127.75 based on manufacturer's data.
8. Replacing a 6ft T12 tube at 95Watts with 6ft T5 tube at 53 Watts = 42Wattsx2000 for hoursx20cents/1000=saving of €16.80 per tube, based on manufacturer's data.
9. A leak of 1 litre/hour results in a hot water loss of 8,500 litres/year equivalent to 3800kWh/year. Cost: 3800kWh x 20cents/kWh day rate = €760
10. ADAS. Managing Energy and Carbon – the farmer's guide to energy audits. ADAS.UK.
11. Teagasc. 2011. Energy Use in Agriculture. Teagasc, Oak Park, County Carlow. Savings on plate heat exchangers - Overall dairy energy consumption average is 350kWh/hd/year and cooling costs for milk are typically 40% = 140kWh, (with 70% on night rate of 10c/kWh and 30% on day rate at 20c/kWh). 140kWh for milk cooling per head = 140x70%x0.1+140x30%x0.2) = €18.20x50% = saving €9/cow/year.
12. Farm Energy Centre, UK.
13. Teagasc 2011.
14. Carbon Trust. 2005. ECG089 Energy Consumption Guide - Energy Use in Pig Farming. Carbon Trust, UK.

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Grass is the most important feed for livestock. It provides 70-80% of cattle feed requirements and over 90% of the feed requirement of sheep.

Here are some tips to help you get the most from your grassland.

€ Better grazing management can increase farm profitability by €250 – 350/ha

A 10% increase in the proportion of grazed grass in a dairy cow's diet reduces costs of production by 2.5 cent/litre. Grass budgeting is essential to ensure pasture based systems of production are profitable and efficiently convert grazed grass into milk.

The main ways to increase the proportion of grass in the animal diet is:

1 Extend the grazing season into early spring and late autumn.

   This can be achieved by implementing grazing management practices such as timely closing of paddocks in autumn for early spring grazing, where weather allows.

2 Where possible match the herd calving pattern to the grass growing season.

   Begin calving when grass starts growing – this results in most cows calving between 10th February and 1st March.

   Target an opening farm cover of 600 – 700 kg DM/ha.

3 Match stocking rate to the grass growth potential of the farm.

   e.g. A cow consumes 5t grass DM. If farm is growing 14 t DM/ha it can be stocked at 2.8 cows/ha (14 ÷ 5 = 2.8).

4 Ensure soil fertility is optimised (see soil fertility section).

5 Implement a timely re-seeding programme to maximise sward productivity.

6 Carry out regular farm grass cover measurement and grass budgeting.

7 Ensure that farm infrastructure is sufficient to fully utilise grass grown, especially during periods of wet weather.

8 Supplement with concentrate or high quality baled silage when grass is in short supply.

9 Use on-off grazing during periods of wet weather to keep grass in the cows diet, provided soil conditions allow.

Maximise grass production and profitability throughout the year.

Spring

Simple Rule:[1]

- Turnout in mid-February
- 30% of farm grazed by 1st March
- 60% of farm grazed by 17th March
- 100% of farm grazed by first week in April

Graze paddocks to 3.5 cm during the first rotation

€ Each extra day at grass in spring is worth €2.70/cow/day

Mid-season

During mid-season the farm should be walked at least once per week and the farm cover (amount of grass on the farm) assessed.

Target pre-grazing yield is 1300 – 1600 kg DM/ha. Target post-grazing height during the main grazing season is 4 – 4.5 cm.

- If there is a surplus of grass on the farm, remove the paddock from the grazing system and cut for winter fodder.
- If there is not enough grass on the farm, the animals may need supplementation with silage or concentrate.
- Rotation length should be 18 – 21 days.
- Keep topping to a minimum as it delays re-growth of pasture. One round of topping to <4.5cm should be enough and should be completed from mid-May to late June.

€ Maintaining the correct pre-grazing yield and post-grazing height during the main grazing season generates an extra €150/ha in milk receipts

Autumn

A 60:40 autumn rotation plan helps extend the grazing season into late autumn. Autumn closing management has the largest effect on spring grass supply. Start increasing rotation length by 1 day per week from 1st August. Rotation length should be >35 days from mid-September.

Simple Rule:

- Start closing 10th October.
- 60% of the farm should be closed by 1st week November.
- Remaining 40% should be closed by 1st December.

* These dates should be a week to two weeks earlier on heavier soil types or slow grass growing farms.

Once a paddock is closed it should not be re-grazed as this will reduce spring grass supply.

* Each day delay in closing from 1st October to 11th December can reduce spring grass availability by up to 15 kg DM/ha/day.

Close some drier paddocks earlier to facilitate early spring grazing. Graze paddocks to 3.5 – 4 cm during the final grazing rotation to encourage winter tillering. Closing cover target is 550 kg DM/ha for farms stocked at 2.5 cows/ha in late November.

During wet weather

Where soil conditions allow - use on-off grazing

- Allow cows two three hour grazing periods after each milking.
- After each three hour period move cows from the paddock to a stand off area (e.g. a shed).
- Silage supplementation is not necessary.
- Ensure full allowance of grass is offered during these periods as cows adjust their grazing behaviour to achieve full intake.

Be flexible – graze lower grass covers (shorter grass) in wet weather. Ensure a good network of roadways to maximise pasture access and minimise poaching damage. Back fence areas that have been grazed to avoid poaching damage. Poaching paddocks can reduce grass growth throughout the year, particularly on heavy farms.

Reseeding

Achieving high levels of grass production and animal performance from swards which do not have a high proportion of perennial ryegrass is very difficult.

High perennial ryegrass swards can produce 3 DM/ha more than swards with low levels of perennial ryegrass. Swards with low levels of perennial ryegrass are not as responsive to nitrogen. Greater spring growth is achieved with high perennial ryegrass swards. Pastures with <65% perennial ryegrass should be reseeded.

Spring is the best time to reseed

- A spring reseed produces as much grass in its year of establishment as an old permanent pasture.
- It is easier to establish clover in spring reseeds as soil temperature are more stable then.
- Greater chance of more suitable weather and soil conditions.

Guidelines when choosing a seed mixture:

1 Choose a grass mix that has good spring and autumn production, as most mixes have similar mid-season productivities.

2 Choose varieties with a narrow range in heading dates (7-10 days).

3 Choose a grass mix that provides adequate ground cover.

Choosing the right varieties:

The majority of pre-mixed grass seeds available from your local co-op are well balanced mixtures with varieties from the Irish recommended list.

Grazing

- Choose mainly late heading diploids but also have a proportion of tetraploid varieties.
  - Tetraploid varieties have the highest DM yields and large leaf area, even though their tiller density is lower than diploids.
  - Dry matter yields of tetraploids are generally on average 1 t DM/ha higher yield than diploids.
  - Tetraploids should be combined with high ground cover, highly digestible diploids.
  - 40% tetraploid is sufficient in a seed mix, higher levels of tetraploid can be used, but sward management should be adjusted to protect it from damage during the shoulder grazing periods.
- It is better use grass varieties that have similar heading dates, (e.g. 7-10 days), a wider range in heading dates will be reflected in a longer heading period.

Silage

- Intermediate heading varieties should be included in the seed mixes for intensive silage swards.
- Tetraploid varieties should make up about one third of silage mixes.
- For swards cut once a year and then grazed, the amount of intermediate can be reduced, and late heading cultivars can be used.
- Low yielding late diploids should be avoided on the land targeted for continuous silage harvests.
- Whatever the varieties in intensive silage systems, persistency will become an issue if high silage yields are harvested to low cutting heights.

Clover

- In grazing swards small and medium leaf clover varieties are recommended in combination with late heading perennial ryegrass varieties as they are more persistent than large leaf varieties.
- Care must be taken with the larger leafed clovers as their aggressive growth habit dominates swards over time. Varieties with high yield potential and good grazing persistence at both high and low nitrogen levels should be used.

Management of swards after reseeding

- Best time to control docks and other weeds is after reseeding.
- Apply post-emergence spray 6 weeks after establishment.
- Graze swards as soon as the new grass plants roots are strong enough to withstand grazing (i.e. can not be pulled out of sward).
- Aim to graze reseeded pastures 60 days after reseeding.
- Frequent grazing of light covers (<1400 kg DM/ha) during first year after establishment will help the sward to tiller and reduce opportunity for weed establishment.
- Check reseeds for slug/leatherjacket attack.
- If possible avoid cutting silage on the reseed during the first year.

1. These dates should be a week later on heavier soil types or slow grass growing farms.

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The cost of water supplied by local authorities has escalated, with the average cost now €1.11/m^3 (€5.00 per 1,000 gallons).

The top tips below will help you save money and protect the environment by encouraging you to eliminate water leaks and replace treated water with harvested water.

Study your Water Bill – It Could Highlight a Problem!

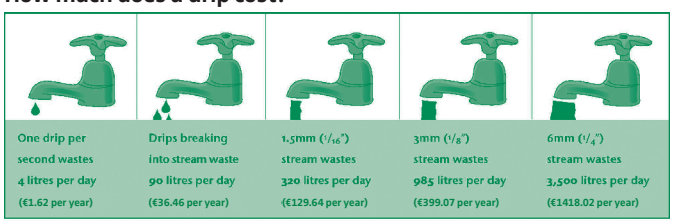
If your water is supplied by the council, you will get water statements each year which sets out the amount and cost of the water you use.

Complete the table below which sets out average daily water use and then compare this with the amount of water used on your statement. Higher than average water use may mean that you have a water leak and are wasting water and money.

	A	B	A x B
	Daily Water Consumption[1]	No. of Animals	Total Use
Dairy Cow	90 litres		
Dry Stock	45 litres		
Poultry (per 100 Birds	40 litres		
Pigs	20 litres		
Ewe	5 litres		
Total Use			

Locate & Fix Leaks – It Will Save you Money

How much does a drip cost?[2]



€ Spend 70 cents on a replacement washer for a tap - it could save you €36 on your water bill in one year

Most water losses are due to simple problems with small appliances.

For example, replacing a washer at a cost of 70 cents on a dripping tap losing 90 litres per day can save you €36 per year.

Repairing a leaking ball-valve on a trough will save up to 150 cubic metres (33,000 gallons) a year[3]. This will reduce your water bill by almost €170.

Finding leaks in buried pipes can be problematic. Where there are several pipes being fed through one meter, consider installing an isolation valve at the head of each line so that a pipe with a leak can be quickly identified.

Consider taking photographs as pipes are being laid and include the layout of water pipes on your farm maps. It will be a help in leak detection. Sometimes replacement of pipe work is necessary. Replacing a leaking pipe on a County Cork farm cost €450. The old pipe was losing 2,700 cubic metres per year, at a cost of €1,840 [1].

Install a Water Meter – It Will Detect Leakage & Waste

A water meter can be a useful demand management tool and be the first indicator of a water leak

To find out if you are losing water, turn off all water appliances and then check each meter. If the meter is still turning, then you have leaks. If it's not turning but your costs seems too high, this may be down to wastage through simple things like leaving a tap running.

A running tap can use up to 10 litres (2.2 gallons) of water a minute[3]

Carry out regular checks on the flow of water into particular fields or group of fields. Drain unused drinkers in winter. Turn off field connections at the meter box when animals are off the land.

Future Proof Your Water Pipes

Leak prevention is more cost effective than paying for lost water or repairing leaks that have occurred.

Insulate exposed pipes and buy quality plumbing fittings. It will save money and grief!

Sub-standard fittings on a drinking trough are liable to blow, resulting in substantial water loss. By the same token, exposed pipes will inevitably freeze and this may result in a costly rupture in addition to the loss (albeit temporary) of your water supply.

When planning excavation works, be sure to consult the map of your pipe-work, so as to avoid severing a water line.

Reduce use by Recycling Water

The pay-back period on proprietary rainwater harvesting systems is long (especially if retrofitting)

Rain water harvesting from the roof of a farm building can be used for hosing the floor of a dairy parlour, cattle shed or farmyard and may also be suitable for animal consumption. It can also be used for cooling milk.

If water is being used for washing, use a scraper or brush to remove solid wastes from yards and pens before hosing.

Rinse small equipment in a bucket of water rather than using a hosepipe.

Footnotes

1. Data provided by the National Federation of Group Water Schemes
2. Environment Agency 2007. Waterwise on the Farm - Version 2. A simple guide to implementing a water management plan. Environment Agency, Bristol, UK.
3. Cork County Council - Water Conservation for Farms

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Feed costs are the biggest cost on livestock farms. These top tips will assist you get the best from your feed and help deliver higher returns.

Keep Livestock on Grass Longer - It's the Cheapest Feed!

€ Each extra day at grass can reduce milk production costs by 0.16c/l[1] and is worth €1.54 per suckler cow/day[2]

Feeding good quality grazed grass is almost four times cheaper than concentrates

Table 1: Cost of Feedstuff Types[3]

Feedstuff	Cost (c/kg utilisable Dry Matter)
Concentrates	30+
2nd cut silage	17.4
1st cut silage	16.5
Kale	17
Maize silage	15
Grazed grass	8

Grass growth and use is largely dictated by prevailing weather conditions, therefore cost savings will vary with soil conditions and rainfall. However, in general feeding good quality grazed grass is almost four times cheaper than concentrates.

Suitable soil conditions may allow you to consider extended grazing.

Reseed – It Increases Grass Yield and Performance!

€ Reseeding 10% of the farm each year will increase net profit by 1.2c/l[4]

Perennial ryegrass delivers highest yields across all soil types. Aim for 65% perennial ryegrass in swards. Grass breed selection and yields are impacted by soil conditions. Correct soil fertility and pH levels are essential for good sward establishment. The optimum range for soil pH levels for perennial ryegrass is 6.2 to 6.7.

Know your silage quality – Poor silage means higher meal bills!

€ Concentrate feed costs for in-lamb ewes increases by 8% for each 1% fall in silage DMD[6]

€ Concentrate feed requirements for dairy cows increase by 4% for each 1% decline in silage DMD

Increased DMD increases the amount of energy available from silage and leads to improved animal performance in terms of milk yield and body weight gain.

Table 2: Comparison of the value per tonne of DM of silages of varying quality

Silage	Dry matter digestibility %	Net energy value per kg dry matter (UFL)[7]	Value per tonne DM
Grass silage	78	0.87	216
Grass silage	72	0.81	175
Grass silage	70	0.78	155
Grass silage	68	0.75	140
Grass silage	60	0.66	100

Adapted from S. Kavanagh 2012[8]

A silage analysis costs approximately €35. This is equivalent to approximately 95 kg of concentrates[9]. Poor silage quality is characterised by low DMD. Delayed harvesting has a major influence on silage quality. While there will be increased yield it will result in more of the silage passing through the animal undigested.

Each 1 unit increase in silage dry matter digestibility will increase carcass gain by 24g per day in finishing beef cattle[10]. For example, increasing your silage DMD from 60% to 70% will increase carcass gain by 250g/day

Know Your Ration

High protein does not mean high energy

The protein value of any feedstuff is best measured by the quantity of protein that is absorbed by the animal, not what the animal consumes

The cheapest ration does not mean the best value.

Rations should be bought firstly on the basis of their energy content, next protein, then minerals and finally fibre. If livestock are not performing well, (losing body condition or low milk proteins), then the problem is usually a lack of energy. This is generally the most limiting nutrient in grass based livestock diets.

Ingredients in rations are listed in order of decreasing inclusion level although the quantities included are not listed. Anything listed below molasses is making a minimal contribution to the ration.

Good Energy Sources in Rations

Top quality energy sources include barley, wheat, distillers grains, maize and beet pulp.

Know the energy value in feedstuff by looking at the net energy value which is expressed in terms of feed units (UF). In most feeding systems the net energy value is known as UFL, for intensive finishing cattle it is UFV. Barley is the standard feed in this system and all other feeds are given values relative to barley, which has UFL of 1.0 on a fresh weight basis. [11]

Good Protein Sources in Rations

Top quality protein ingredients include soyabean meal (the best protein source) distillers, rapeseed meal and more limited availability ingredients like peas and beans.

The protein value of any feedstuff is best measured by the quantity of protein that is absorbed by the animal, not what the animal consumes. Protein that is absorbed into the animal comes from bacterial protein in the rumen and protein that passes through the rumen undegraded. Each feed you purchase will have two protein values PDIN and PDIE.[12] The lower of the two values is the actual protein value of the feed.

Table 3: Energy and Protein values of Dry Feeds

	Energy	Protein		
Dry Feeds	**UFL (per kg DM)**	**CP g/kg**	**PDIN g/kg**	**PDIE g/kg**
Barley	1.0	98	64	89
Distillers grains	1.02	266	178	119
Rapeseed meal	0.91	338	219	130
Citrus pulp	1.0	60	40	80
Wheat Feed	0.76	87	101	79
Sunflower	0.56	246	159	89
Palm Kernel	0.80	171	136	148
Soya	1.01	481	342	232
Soya hulls	0.92	105	68	94
Maize	1.05	87	71	103
Beet pulp	1.00	88	56	97
Maize gluten	0.90	203	137	108

Buying rations containing feedstuffs with the highest UFL represents better value per tonne. You are buying more energy. Ask your feed merchant for a list of the feedstuffs and the quantity of each per tonne.

Remember the cheapest ration does not always represent the best value.

Correct Mineral Deficiency

Severe mineral deficiency will reduce animal performance.

Reduced fertility and increased disease incidence can also occur.

Step 1: Identify Mineral Deficiency

While the identification of a mineral deficiency can be quite difficult and often symptoms overlap between different minerals, items to consider include:

1. History of the farm – Have deficiencies occurred in the past?
2. Clinical signs – These may include reduced growth, infertility, drop in milk yield, and reduced litter size.
3. Soil test – Are mineral levels in the soil low or does the soil contain high levels of antagonists which bind to a mineral making it unavailable to the animal?
4. Feed test – This is the source of minerals for your animals.
5. Blood or tissue tests – Should only be used in combination with the above approaches.

Step 2: Select Correct Supplementation Option

The second step is to decide the best supplementation option for your farm?

1. Top dressing pasture
2. Supplementation through the water system
3. Top dressing silage
4. Incorporation into concentrate feeds
5. Injectables, drenches and boluses
6. Free access mineral supplements

When developing a mineral supplementation programme, obtain independent expert advice and consider the cost, ease of use and uniformity of supplementation.

Prepare a Feed Budget

A feed budget is an essential management tool on livestock farms.

During the grazing season budgets can change on a weekly basis due to the dynamic nature of grass growth. Weekly grass measurements and grass budgets should be considered in order to assess the quantity of feed available on the farm. This will allow you to make decisions in advance of periods of deficit or surplus.

Fodder planning - Estimate your winter feed requirements against your winter feed supply[13]

STEP 1 – Calculate winter fodder required

Pit silage

Stock Type	No. of animals (a)	No. of winter months (b)	Pit silage needed/ month (c)	Total tonnes (a x b x c)
Dairy cows (dry)			1.3 – 1.4	
Dairy cows (milking)			1.6	
Dairy in-calf heifers			1.3	
Suckler cows			1.4	
Store (500kg)			1.3	
Weanling			0.7	
Ewe			0.17	
Other				
A = tonnes of pit silage required				

Bale silage

Stock Type	No. of animals (a)	No. of winter months (b)	No. of bales/month (c)	Total no. bales (a x b x c)
Suckler cows			2	
Finishing beef			1.7	
Store (500kg)			1.9	
Weanling			1.1	
Ewe			0.2	
Other				
Total no. of bales				
B = Tonnes of bale silage required = no. of bales X 0.61 [14]				

Total fodder required (tonnes) = A+B	

STEP 2 – Assess the quantity of fodder available

This requires calculating the quantity of silage in the pits and in bales. Remember to include bales of hay, straw and any other fodder you have on the farm.

Measure all silage pits in metres – multiply the length X breath X average settled height = volume of silage in m^3. To convert from volume in m^3 to tonnes apply the conversion factors in the table below.

No. of silage pits	Length (metres) (a)	Breath (metres) (b)	Average height (metres) (c)	Volume m^3 = a x b x c	Convert m^3 to tonnes x by 0.77 @20% DM x by 0.69 @ 22% DM x by 0.68 @ 25% DM x by 0.61 @ 30% DM	Tonnes corrected to tonnes of grass silage at 20% DM[15]
Silage Pit 1						
Silage Pit 2						
Silage Pit 3						
C = Total tonnes of pit silage (corrected to tonnes of silage equivalent at 20% DM) =						

Other fodders such as hay and straw can be converted from bales to tonnes of silage equivalent (@20% DM) to determine your total fodder supply in tonnes.

Bales 4x4	No. of bales (a)	Weight per bale tonnes (b)	Factor used to convert to the equivalent tonnes of grass silage at 20% DM (c)	Total feed supply (equivalent to grass silage at 20% DM) = (a x b x c)
Grass silage @ 30%DM		0.6	1.5	
Grass silage @ 25%DM		0.7	1.35	
Hay bales @ 82% DM		0.24	4.1	
Straw bales @ 88% DM		0.15	4.4	
D = Total tonnes of bales corrected to tonnes of silage equivalent @20% DM =				

Total fodder available = C + D	

STEP 3 - Calculate fodder surplus or deficit

To determine if you have a surplus of deficit of fodder, subtract your tonnes of fodder required calculated in STEP 1 from your tonnes of fodder available calculated in STEP 2.

Deficit/Surplus = (A+B) – (C+D) =	**Tonnes**

Footnotes

1. Läpple, D., Hennessy, T. and O'Donovan, M. Extended grazing: A detailed analysis of Irish Dairy farms. Journal of Dairy Science, 95:188–195.
2. O'Donovan, M., Hennessy, D. and O'Riordan, E. 2011. Potential of Grass for production and Cost Savings. Proceedings of Teagasc National Beef Conference 2011.
3. Teagasc Grange 2013, Grange Feeding Cost Model (GFCM).
4. Shalloo, L., Creighton, P. And O'Donovan, M. 2011. The economics of reseeding on a dairy farm. Irish Journal of Agricultural and Food Research, 50: 113-122.
5. Keady, T.W.J, Hanrahan, J.P., Marley, C. And Scollan, N.D. 2013. Production and utilization of ensiled forages by beef cattle, dairy cows, pregnant ewes and finishing lambs. A review. Agriculture and Food Science, 22:70-92.
6. DMD = dry matter digestibility.
7. Barley is the standard feed in the net energy system adopted in Ireland and all other feeds are given values relative to Barley. Standard barley has a net energy value of 1 UFL or 1UFV per kg fresh weight.
8. Kavanagh, S. 2012. Facing the Fodder Challenge 2012. http://www.teagasc.ie/publications/2012/1581/LMC_SKavanagh.pdf
9. At a cost of €410 per tonne.
10. Keady, T.W.J, Hanrahan, J.P., Marley, C. and Scollan, N.D. 2013. Production and utilization of ensiled forages by beef cattle, dairy cows, pregnant ewes and finishing lambs. A review. Agriculture and Food Science, 22:70-92.
11. S. Kavanagh and J. Murphy. 2000. Winter Feeding for Spring and Autumn Herds. National Dairy Conference Teagasc.
12. PDIN and PDIE, the quantity of protein made by bacteria in the rumen or first stomach is dependent upon the supply of nitrogen and energy. If there is a limited supply of nitrogen the protein value is called PDIN. If there is a limited supply of energy the protein value is called PDIE.
13. Based on Teagasc Advisory Fodder Shortage Worksheet 2012 by Siobhan Kavanagh.
14. Average weight of a silage bale taken at 600kg/bale.
15. To convert tonnes of silage to tonnes of silage equivalent at 20% DM where you have differing silage dry matter you need to multiply by the following conversion factors –
    Silage DM @ 20% multiply by tonnes by 1.0;
    Silage DM @ 22% multiply tonnes by 1.1;
    Silage DM @ 25% multiply tonnes by 1.25; and
    Silage at 30% DM multiply tonnes by 1.5.

Smart Farming

A Guide to Help Improve Farm Returns with Better Resource Management

Inputs such as fertiliser, feeds and harvesting costs account for over 75%[1] of variable costs on livestock farms.

Here are some tips to help your save money and time by managing inputs and minimising losses and spillages.

€ Save €26/cow over winter months by reducing spoilage and losses when feeding fodder

Aim for 20 - 25% dry matter content for pit silage and 25 - 30% dry matter content for round bales.

For pit silage use two sheets of black 0.125mm thick polythene. Fast filling and quick sealing limits heating and preserves feed quality. Fully cover from edge to edge with tyres or other suitable materials[2].

For round bales, aim to produce firm bales with a target of at least 600kg/bale fresh weight (4ft x 4ft). Wrap bales within one hour of baling with 4 layers of good quality stretch or 6 layers where more handling or longer storage is required[3]. Transport bales to storage area immediately after wrapping and do not puncture. Protect from birds, vermin and livestock.

€ Reduce losses in the pit and at feeding by 7%. It will result in savings of €15 per tonne DM fed or €26/cow over 5 month winter feeding period[4]

One small hole (3mm) per bale resulted in an 8% loss of edible silage; while one large hole (24mm) resulted in 33% loss of edible silage[5]

Reduce silage effluent - It saves money, reduces corrosion and minimises pollution risk

Reduce the effluent produced by almost 12,000 gals - by increasing the DM of grass at ensiling from 20% to 24%[6]

Based on 600 tonne of grass

When possible - Wilt grass prior to ensiling. It will reduce the amount of silage effluent that is generated. This saves money by reducing landspreading costs, environmental risks and corrosion of your concrete. How much effluent do you produce?

Effluent produced per tonne of fresh grass ensiled	
DM%[7] of harvested grass	Litres effluent/tonne
18	210
20	160
22	120
24	70
26	20
28	0
30	0

Consider buying feed and fertilizers in bulk – It can save you up to €15 per tonne

Consider buying feed and fertiliser in bulk (1 tonne or 500kg bags). This will save money and minimise the amount of packaging waste. The difference can be up to €10 to €15 per tonne.

Feed production costs (fertilizers, purchased concentrates, harvesting costs etc.) account for over 75% of variable costs on Irish livestock farms[8]. Ensure that any losses through spillages and spoilage during storage are minimised. Use appropriate storage facilities, which are dry. Ensure birds and vermin do not have access to the storage area.

Each 1% loss of purchased concentrate through spillages and spoilage in store costs you €3 per cow. For example, a 3% loss on a 60 cow dairy herd feeding 1 tonne concentrate costs €540 or €9/cow[9].

A 5% loss of fertiliser through overspills or poor handling and storage costs you €21 per tonne purchased of 18:6:12. If you purchase 25 tonnes of fertiliser for a typical 60 cow herd, this will cost you approximately €525.[10]

Minimise waste on the farm

Prevent waste being generated by looking at the amount of packaging on goods purchased. Designate a clean dry area on the farm where wastes are segregated and stored before recycling or disposal. Waste materials have the potential to cause harm for farmers, animal health and the environment. Some wastes will be hazardous because of certain properties such as being flammable, toxic or irritant. Such materials should not be left lying around the farmyard. Dispose of waste using the guideline below. Remember it's illegal to bury or burn wastes on your farm[11].

Waste Type	Action
Waste oil, waste oil containers, oily filters, oily rags, waste brake fluids, waste hydraulic oils are all hazardous waste	✓ If machinery is serviced by a mechanic, ask the mechanic to take the oily wastes away. If the wastes are generated on-farm by yourself, only an authorised hazardous waste contractor should be used to dispose of the waste. ✓ Some local civic amenity sites will accept small quantities of waste oil; check at your local site. Don't stock pile waste oils, bring them to your civic amenity site as they are generated on your farm.
Lead based, solvent based or chromate based waste paints are considered to be hazardous waste and can be toxic to livestock	✓ If these waste are on your farm, only an authorised hazardous waste contractor should be used to dispose of these ✓ Some local civic amenity sites will accept waste paints, check with them.
Tractor/car and portable batteries are hazardous waste	✓ All shops that sell batteries are required to take-back waste batteries for free. ✓ Car and tractor batteries should be returned to your local garage or tractor dealerships. ✓ Electric fence batteries should be returned to your local agri-merchant. For more information see www.recyclefree.ie
Waste electronic and electrical equipment (WEEE) is equipment that requires a battery or plug to work and is no longer operational	Some WEEE is hazardous waste because of certain substances and/or components it contains. e.g., Fluorescent tubes; Fridges and freezers and old TV and computer monitors. ✓ Household WEEE can be brought to a civic amenity site and be recycled for free. ✓ WEEE relating to an agricultural production system can be brought back to the producer who is required to operate a take-back collection scheme.
Most animal health waste arising from the treatment of animals on farm is deemed to be hazardous waste because of its hazard properties and contamination with bodily fluids	These include expired, unused and residual medicines, syringes and needles, disposable gloves and some aerosol cans. ✓ Ask your vet to take back veterinary wastes generated during the farm visit. ✓ Unused and expired animal remedies can be brought back to the veterinary practice or pharmacist where the medicine was purchased free of charge[12]. ✓ An authorised hazardous waste contractor should be used to dispose of hazardous animal health waste due to its hazard properties and biosecurity risks.
Recycle used silage covers and wrap from silage bales at recycling centres such as those operated by the Irish Farm Film Producers Group or any other authorised waste contractor [13]	Other farm plastics which are now accepted include bulk and small feed and fertiliser bags, netting and twine and triple rinsed empty pesticide containers[14]. Keep used silage wrap and sheeting as clean and dry as possible and avoid contamination with slurry, manure or soil. Triple rinse empty pesticide containers immediately after use in accordance with EPA and Department of Agriculture 7Steps: Good Practice Guide for empty pesticide containers. Only triple rinsed pesticide containers managed in accordance with this guide can be classified as non-hazardous waste and accepted at recycling centres.

Footnotes

1. Hennessy. T., Kinsella, A., Moran, B., and Quinlan, G. 2001. Teagasc National Farm Survey 2011. Teagasc, Athenry, Co.Galway.
2. Waste Management (Tyres and Waste Tyres) Regulations 2007, SI 664 of 2007.
3. O'Kiely, P., and Forristal, D. 2003. Ten tips for making good quality baled silage. Teagasc Grange and Oakpark Research Centres. Ireland.
4. Reducing total losses from 30% (poor management) to 23% (average management) to 16% (excellent management) reduces the costs of providing livestock with silage from €203 to €185 to €170/tonne DM eaten. Based on dairy cow eating 1.6 tonnes FW silage per month for 5 months at 22% DM. Cost of producing 1 tonne of silage DM = €150.
5. McNamara, K., O'Kiely, P., Whelan, P., Forristal, D., and Lenehan, J.J. 2002. Simulated bird damage to the plastic stretch-film surrounding baled silage and its effects on conservation characteristics. Irish Journal of Agriculture and Food Research.. Vol.41, No. 1, June 2002.
6. Weissbach, F. and Peters, G. 1983. Quality chemical composition and feed value of silage effluent. Feldwirtschaft, 24: 78-81.
7. Typical contractor charges €40 to €50 per hour for a splash plate tanker. If they spread 25m^3/hour, the cost of spreading is approximately €1.50/m^3 or about €7/1000 gallons.
8. Hennessy, T., Kinsella, A., Moran, B., Quinlan, G. 2011. National Farm Survey 2010. Teagasc, Athenry.
9. Typical industry loss from feed is approximately 1.5%. Figures calculated for typical 60 cow herd fed 1 tonne of purchased concentrate feed at €300/tonne at 3% losses from spillages and spoilage during storage.
10. Typical industry losses for fertiliser are 0.5%. A loss of 50 kg/tonne equates to losses of 5%. A dairy farm with 60 cows will purchase approximately 25 tonnes. Price of 18:6:12 is €420/tonne.
11. Waste Management (Prohibition of Waste Disposal by Burning) Regulation, S.I.No. 286 of 2009.
12. Animal remedies Regulations SI No. 734 of 2005.
13. Go to www.nwcpo.ie for a list of authorised waste collectors.
14. EPA and DAFM. 2012. 7 Steps: Good Practice Guide for Empty Pesticide Containers. EPA, Johnstown Castle Estate, County Wexford. Ireland.

Smart Farming

A Guide to Help Improve Farm Returns with Better Resource Management

Farming is a demanding job. It requires a high level of knowledge and ability in animal husbandry, machinery management, feed management and many other areas.

It can also encroach into family time, particularly during calving and harvesting. Your time is an important resource. Here are some practical tips to help you plan your time more effectively.[1]

Prioritise

Prioritising is a must. In other words, spend your time doing the most important work first. Do a list of the jobs to be done around the farm and list them based on their importance.

Know the difference between urgent and important. Something might be urgent to someone else but is it urgent enough for you to ignore an important job that you need to complete?

Get help

Tap into temporary help to do important but time-consuming and routine tasks. For instance, if your invoices are a mess or the yard is untidy consider hiring someone for a short period.

Categorise

Organise your work into categories like ''do today,'' ''action needed this week'' and ''ideas'' Sort tasks and jobs as they come to you.

Time management experts say most people can spend up to seven hours each week just looking for things or being distracted by clutter

Do not take on too much work

It's generally recommended you plan only about 70 percent of your day. Leave the rest of the day for interruptions and unexpected events, which is something that farmers are all familiar with given the nature of the job. Also, set aside some time for planning and thinking about ideas that could improve the efficiency of your farm business.

Focus

Do not try to multi-task. Concentrate completely on one task at a time. You will be able to work faster and to a higher standard. This is also a much safer way of working and will help prevent farm accidents from happening.

Do not skip meals

After a few hours, even when you are doing something you enjoy, or really engaged in the task at hand, there is still a tendency to burn out. Energy and productivity are improved by taking a break and thinking or talking about something else for a while. If you have fallen into the trap of thinking you will be more productive by working through lunch, the reverse may actually be true.

Family time

Spending time with your family and friends is important. Try adjusting your work so you can spend a set amount of quality time with them, if possible.

Book holidays

It's important to take a break from the busy life of a farming. Make sure you take at least one short break a year. It often leads to an increase in productivity on your return.

Footnote

1. Agri-view 2013, Time Management Tips

Smart Farming

A Guide to Help Improve Farm Returns with Better Resource Management

Machinery running costs need to be managed carefully. Here are some tips that can help cut down on machinery costs.

Know your diesel fuel use

Operation	Average Fuel Use (litres/ha) [1&2]
Ploughing	21
Heavy cultivation	13
Rotary cultivation	13
Fodder harvesting	12
Combine harvesting	11
Rotary mower	5
Grain drilling	4
Rolling	4
Fertiliser spreading	3
Spraying	1

Manage diesel fuel use

€ **Remove unneeded tractor weights. It will save you at least 1 litre of diesel per hour of tractor use [3]**

Action	Result
Keep records of your fuel use/invoices	If you measure it, you can improve on it
Turn the engine off; don't just let it idle	Idling accounts for 6% of fuel use, the equivalent of about €186/year! [4]
Shift up a gear and throttle back - when doing lighter field jobs or on road travel	Higher speed, lower engine revs, lower emissions and better fuel economy
Consider using a quad when checking livestock	Reduced fuel use
When renting land – consider the fuel costs of getting to and from the land	Travel to distant land blocks can cost from €22 to €150/ha in machinery costs [5]

€ **Idling accounts for 6% of fuel use, the equivalent of about €186/year! [4]**

€ **Travel to distant land blocks can cost from €22 to €150/ha/year in machinery costs [5]**

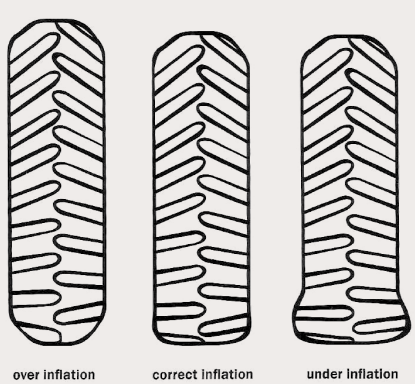
Check tyre pressure regularly

€ **20% fuel savings can be made if lower tyre pressures are used for field work [6]**

During times of heavy machine usage, check tyre pressure once a week.

When using duals, make sure that they are accurately matched with the same tyre size.

Know the correct tyre inflation pressure by seeing how many lugs of the rear tractor tyre are in contact with the ground; there should be at least 3 but not more than 4 lugs touching the ground.



Service machines at regular intervals[7]:

Tractor checklist

Task	Daily check	Weekly check	Other
Dipstick gearbox oil level		x	
Dipstick engine oil level		x	
Change the engine oil and oil filters			After 400 hours
Change the gearbox oil			After 800 hours
Ensure the handbrake is working properly	x		
Check wheel nuts/bearings		x	
Check/adjust tyre pressures		x	
Ensure pto U-guard is intact	x		
Replace fuel filters			After 400 hours
Clean mirrors and cab glass	x		

Dirty diesel filters should be replaced after 400 hours to keep your tractor working efficiently and prevent costly injector trouble

Slurry tanker checklist

Task	Daily check	Weekly check	Other
Check oil level in the gearbox	x		
Check the vacuum pump oil level		x	
Check the oil dropper (should drop oil into pump vanes at rate of 1 drop/second)	x		
Change the gearbox oil			After 300 hours
Ensure the handbrake is working properly		x	
Check wheel nuts/bearings	x		
Check pressure guage and replace if not working	x		
Ensure pto guard is intact and fastened at both ends	x		
Wash and clean the inside of your tank			Yearly
Check the rear gate valves for leakage and/or blockages	x		

Carry out a daily check to ensure the PTO guard is intact and fastened at both ends. To help make your farm a safer place, replace worn shaft covers immediately

Fertilizer spreader check list

Component	Daily check	Weekly check	Other
Calibrate your spreader using a tray test at least once every two seasons			Every 2 seasons
Tighten the lift arm stabilisers to prevent rocking and minimise bias		x	
Ensure the top link is set so the discs are slightly higher at rear than front	x		
Maintain the same forward speed once you start spreading, eg 10kph	x		
Always cover the spreader hopper to keep fertiliser dry and spreadable	x		
Check to see that the agitator is running freely	x		
Check the spreading vanes for wear, pitting and indentations			Monthly
Replace spreading vanes (typically costs €350 for a 12m machine)			After 3 seasons

Check the spreading vanes for wear, pitting and indentations each month. Replace the vanes once every three seasons

Protect your equipment against machinery theft

€3million worth of equipment is stolen from Irish farms each year, and over 100 tractors

A tractor equipped with a tracking system is four times less likely to be stolen and six times more likely to be recovered if taken

Tracking device can be retrofitted for under €300

Footnotes

1. Brian Witney. 1988. Choosing and using farm machines. Longman Scientific and technical. Essex. UK.
2. EU Efficient 20 Project: Efficient 20 http://efficient20.eu
3. Based on 1,000kg rear tractor weight
4. Based on research carried out by John Deere, Mannheim, Germany
5. Dermot Forristal. 2012. Fuel efficiency 10 ways to save on fuel. Teagasc Today's Farm. Volume 23, No.5.
6. 12 psi for rear wheels; 14psi for front
7. Always follow the guidance in the machinery manual