



Best practice
Grassland Management





Could you make more from your grassland?

Grass is the cheapest source of energy for livestock. No one disputes that. Nor that grassland productivity directly affects the profitability of your livestock enterprise. A fact that is especially relevant given today's feed costs and market economics.

Getting the most from your grassland requires planning and attention to detail. Sward performance is affected by soil structure and condition, nutrient levels, re-seeding frequency and method, seed mixture choice, and the appropriate and timely application of fertilisers and herbicides.

But often time is against you. Every week there are more pressing issues: lame sheep, problem cows, vet visits to prepare for, and yet more paperwork. In busy times, it's easy to fall behind on grassland maintenance, and swards fall short of their potential. This is where the Grassright approach can help you.

Take the Grassright Challenge!

The information in this booklet is designed to help you re-direct your time and efforts to the areas of grassland management which are most limiting to field productivity. After identifying which fields will most benefit from some extra attention, make it your priority this year to focus on improving them.

Follow the guidelines on why, how and when to take the necessary actions. **At the very least, just do one thing extra** to your grassland this year, in addition to your normal practices.

You may opt to rid all weeds from all your grassland. Or you may select key fields for a complete overhaul – plough them up, soil-test, correct P and K indices, destroy leatherjacket populations and reseed with a new ley mixture.

Just do what is manageable.
But do it this year.
And see how much you gain.



Getting started: Field inspections



How much is weed?



Ryegrass has a distinctive purple base of stem



What's the potential to improve?

The first step is to evaluate the state of your grassland so you can identify what actions, on which fields, will give the most significant returns.

Create an inspection report

A useful tool is an inspection report for each field which records type of ley and date sown, ground cover, weed content, soil indices, and history of drainage/compaction.

- A ready-made inspection sheet can be downloaded from www.grassright.co.uk

Walk the field and evaluate the sward

Go into the field and stop in at least 3 different places. Look at the grass in front of your feet. Imagine a 1m square frame and in that area estimate what percentage of the ground is covered with plants and how much is bare. Next, look at the sward content. The only plants that should be present are the ones you have sown, e.g. ryegrasses, timothy and clovers. Estimate the percentage of weeds to the identifiable non-weed grasses.

- For an identification chart of weed grasses and productive grasses, visit www.grassright.co.uk

Check for compaction

At each stopping point, take a spade and dig out a square clod of earth. Drop this onto the ground and vertical fissures should appear. If the ground is compacted, then only horizontal fissures will be seen. In winter, also look out for especially wet areas.

Identify focus for improvements

Review your assessments to identify where there is the best potential to make improvements to grassland quality and/or quantity. Include consideration of the age of the ley: quality and dry matter yields deteriorate as leys get older.

And read on for help and advice on best practice grassland management.

Improving drainage and soil structure

Waterlogged and compacted soils prevent the natural exchanges of air and nutrients, and inhibit root development. Yield losses of 30%+ are common and these conditions will shorten the life of the ley.

Resolving poor drainage

Soil can become waterlogged through poor drainage. Typical signs are ponding, discoloration of the grass and poaching. Ensure field ditches are clear so water does not back up, and repair broken field drains.

Poor soil structure is the most common cause of waterlogging and reduced growth, and different problems require different treatments, as follows.

Breaking up surface capping

Surface 'capping' is caused by large amounts of rain puddling the surface together and preventing air interchange with the roots. It is best alleviated using a slitler. The knife blades typically penetrate up to 125mm deep to improve water and air movement.

Removing Compaction

Compaction under grassland occurs in light and heavy soils alike. Sub-soiling removes compaction so water can move freely down the soil profile, allowing air interchange through the structure. It also improves the ability to travel on land earlier in the spring, promotes earlier growth, and hence allows earlier turnout or silaging.

Livestock themselves cause shallow soil pans 100–150mm deep simply through the pressure exerted by hooves or poaching when animals are left on grass in wet conditions. Compaction from machinery damage, as frequently found in silage fields, is deeper at 200–275mm. Assess what type of compaction the field is suffering from, then subsoil 50mm below the pan using a sward-lifter. Working the ground any deeper just uses more diesel and takes more time.



Is standing water due to poor drainage or compaction?



Aerating the ground using a sward slitler combats surface compaction



Sward-lifting removes compaction without damaging the ley



Improving grass nutrition



Soil test fields every 3-5 years

To cost-effectively improve grass yields, calculate the nutrients needed, and then tailor fertiliser applications to meet this requirement.

Soil nutrient requirements

Soil testing is an essential and inexpensive way to assess nutrient levels. Fields should be tested every 3-5 years to ensure fertility and pH are maintained. Testing one quarter of the farm every year is an easy way to do this; it can be helpful to test more often if there is a known problem in a field, e.g. low P.

Use Defra's Fertiliser Manual (RB209), or obtain advice from a FACTS-qualified advisor to calculate the required grassland nutrients, whether it is for cutting, grazing, or both. For successful establishment, grass and clover need a pH of 6.0-6.5. Grass needs P and K indices of 2 and 2-, and clover needs P and K values of at least 2.

Calculate nutrients added in slurry and FYM

Slurry provides varying amounts of N, P and K. Nutrient levels can be determined by home-test kits, book values or by laboratory analysis which also provides the readily available portion of the N. This information allows you to calculate the nutrient contribution from the slurry and FYM.

Combine soil test results with a manure management plan to identify the best fields to spread manure and maintain indices.

Tailoring fertiliser applications

Having deducted the nutrients available in the manures from the total requirement, select an appropriate fertiliser to supply the remaining necessary nutrients.

- For more details on how to manage nutrients, visit www.growhow.co.uk/advice



Account for nutrients spread in slurry and FYM



Select a fertiliser to supply the necessary nutrients



Improving productivity of existing swards

Better grass yields can often be obtained from improving existing swards, this also enables continued use without taking a field out of production.

Check for compaction

Use a spade to investigate if compaction exists, as described earlier, and deal with it by sward-lifting or slitting.

Weed grasses and old grasses

Old leys might still look green, but are less productive than new ones. Frequently weed grasses like Yorkshire Fog and Meadow Grass have invaded the sward. These are less palatable, indigestible and respond poorly to nitrogen inputs. Even the older grass varieties originally sown are less efficient at utilising nitrogen than modern varieties, and will not have the vigour of young plants. Older plants are also less digestible, so quality is poorer. Overseeding will rejuvenate old leys.

Improve ground cover

Old leys often contain bare areas. Reasons include: disease, winterkill, leatherjackets, poaching – especially around gates and troughs, or where herbicide application has killed off weeds and left an open space. Flooding also kills grass. As well as being unproductive, bare areas are an open invitation for weeds and weed grasses. Overseed to fill these gaps, preferably with a high tetraploid ryegrass mixture which will compete more effectively in an established sward.

Reduce weed populations

Weeds are less palatable and contain less energy than grass. For every 1% of weed infestation that's a loss of 1% of grassland productivity. Effective weed control is reliant on targeting them at the right growth stage. For persistent weeds like docks, select a herbicide that tackles the foliage, as well as translocating down to the roots to prevent re-growth next year.



Dig up a clod of earth and check for compaction



Bare areas are unproductive and an invitation to weeds



Weed grasses are less palatable and contain less energy than ryegrasses, timothy and clover





Harrowing re-invigorates grass growth and sward productivity



Overseeding rejuvenates leys so fields can remain in production



Is a shortfall in sulphur depressing silage yield and quality?

Grass harrowing

Harrowing drags out shallow-rooted weeds like chickweed and annual meadow grass as well as moss and trash from the sward bottom. This gives more space for the existing grass to grow more vigorously. Harrowing also releases locked-up surface nitrogen to the ley and opens up the soil surface to let oxygen get to the roots.

Overseeding

Overseeding an existing ley is an excellent way to boost sward density and yields. Either graze the ley down hard or do this after 2nd cut silage, so that grass length is short and less competitive for new seedlings. Harrowing will create bare areas of ground into which the fallen seed can establish and a combination of harrow and seeder is a cost-effective operation. When overseeding, a small amount of tilth needs to be created by the harrow or, in hard conditions, a previous operation. For both overseeding and reseeding, grass and clover seed needs to be on, or just under, the surface. Roll the ground afterwards – at least twice – to ensure soil to seed contact is established.

Top up sulphur levels in soil

A shortage of sulphur depresses silage yield and quality (protein and sugar levels), and is most likely to occur after first cut. Obtaining a herbage N:S ratio analysis will help to decide whether the herbage is deficient in sulphur. A ratio of 13:1 or greater indicates deficiency, whilst the S content should be in the range 0.2–0.4%. Using a sulphur-containing fertiliser from late spring can boost yield and quality for cutting and grazing.

Similarly, a lack of NPK will affect plant growth – K is particularly important with regard to efficiency of N use, so without sufficient K, money is being wasted. Insufficient P will also hamper growth, especially in spring. It is cheaper to maintain indices than increase them!

Establishing a new ley: best practice

New leys have higher DM yields and sugar and protein levels, and better digestibility and palatability, than old leys. But it's essential to get new leys off to the right start.

Control pests in advance

When converting old leys to new, burn off the old sward with glyphosate. Apply an insecticide to kill off frit fly and leatherjackets in autumn reseeds, and similarly target leatherjacket larvae in spring reseeds.

Create a fine seed bed

Subsoil and plough the field, work the surface tilth down to a fine crumb <10mm in size and consolidate. The key to successful germination is good seed to soil contact so roll twice before seeding to ensure it is firm.

Selecting the right seed mixture

Select an appropriate seed mixture based on intended field use, expected duration of the ley, and according to the type of livestock or management. Where clover-rich leys are the aim, the options are to sow a mixture with clover and control weeds with clover-safe sprays, or to overseed with clover after weeds have been controlled.

Harrow, sow and roll

Grass and clover seed mixtures alike are best spread evenly not drilled in rows as space just allows weeds and weed grasses to populate. This can be done efficiently with a harrow and seeder in combination. Do not sow during periods of drought or very wet weather. Always roll the ground afterwards to ensure seeds have soil contact and access to moisture.

Early control of weed populations

Once grass seedlings have emerged, assess weed populations - chickweed is a major problem in new-sown leys. Apply herbicides for broad-leaved weeds once grass has three true leaves. Slugs can be controlled with an appropriate post-emergence molluscicide.



Obtaining a firm fine seed bed is essential



Select ley mixture best suited to how the field will be used



Chickweed can be a problem in new sown leys



The best times to carry out grassland management activities



Dry calm days are best for spreading



Spray docks at rosette stage (150-250mm in diameter)



Harrowing is also beneficial after muck-spreading

When to subsoil

Grassland subsoiling (sward-lifting) is best done when the ground is relatively dry and will crack and fissure to maximise the benefit. Avoid very dry periods as moisture helps the grass recover. The most suitable times are late spring after first cut and early autumn. Prevention is better than having to subsoil in wet conditions.

When to spread fertiliser

Avoid applying potash to grazing swards early in the year due to the risk of grass staggers, except if soil index is low, when a maximum of 15 kg/ha can be applied. Phosphorus encourages root development, so apply in early spring, after taking into account that already supplied in manures. Sulphur may be beneficial on cut and grazed swards: apply from late spring onwards.

When to take action on weeds

For optimum efficacy, herbicides should only be sprayed onto healthy plants which are actively growing. Fine autumn or spring weather encourages vigorous growth of both grass and weeds, and so is the best time to apply herbicides.

When to take out pests

For autumn reseed, use an insecticide to kill off both frit fly and leatherjackets. Prior to spring reseed, spray against leatherjacket larvae. Check again for leatherjackets in February and spray as needed – clues are: rooks on grass and bare patches.

When to reseed or overseed

Grass-only leys can be sown from April until September, as long as there is moisture in the soil. For clover leys, spring is the best sowing time as warm soil is needed, and a rising temperature is ideal. Late autumn sowing is to be avoided as clover will not germinate at low soil temperatures and seedlings are not frost-hardy.

When to harrow

Grass leys can be invigorated by harrowing as soon as ground conditions in the spring allow.

Calibration, calibration, calibration

Failing to accurately calibrate applications of fertiliser, seed, or chemical sprays can lead to wasted product (and money) and/or a reduction in expected sward performance levels.

Fertiliser spreaders

Fertiliser spreaders should be calibrated for spread rate and spread pattern. For best results, calibrate for every fertiliser type.

A variability of spread pattern, CV*, of 10% is the aim. Uneven spreading becomes apparent at a CV of only 15-20%. For sulphur-containing fertilisers, clean the vanes after every 2 tonnes to ensure continued good spreading.

Muck spreaders

Manure spreaders are difficult to calibrate. So record the numbers of loads applied to each field, and weigh full and empty tanker loads to establish the amount of manure in a load. The most accurate way to spread slurry is with a trailing shoe/hose applicator or an injector – less nitrogen is lost to the air, more nutrients get into the ground, and harmful losses (and odour) are minimised.

Sprayers

Inaccurate sprayer calibration leads to patchy weed control and potential contamination of waterways. Correct spray quality is achieved using the right nozzles, spray pressure, and correct forward speed (refer to nozzle manufacturer's handbook). Check nozzle spray patterns at every use and replace any faulty nozzles. Ideally renew nozzles every 2 years.

Air seeders on harrows

Check airflow and distribution patterns before setting to work and use a good set of scales to calibrate the machine accurately.

*Coefficient of Variation



Check evenness of spread pattern for best fertiliser results



Just having one faulty spray nozzle can result in poor weed control



Remember to account for bucket weight in seed rate calibrations!



About the Grassright Group

The Grassright Group is a collaboration of four companies all with an interest in best practice grassland management.



Grassland machinery supplier

☎ 01778 421111 🌐 www.opico.co.uk



Plant breeder and grass and forage seed supplier

☎ 01472 371471 🌐 www.limagrain.co.uk/grass



Manufacturer of agrochemicals and speciality chemicals

☎ 01925 819999 🌐 www.upleurope.com



Fertiliser manufacturer

☎ 0151 3572777 🌐 www.growhow.co.uk

Getting the grass right

Dairy Farmer, Richard Corlett, Home Farm, Lancashire

Over a three year period: new leys have been sown, docks have been controlled, white clover has been oversown into existing leys, and nitrogen applications cut back. Slurry analysis has allowed the tailoring of fertiliser applications to soil requirements, enabling further savings to be made.

Sward-lifting has resolved soil compaction, reducing poaching and allowing earlier turnouts. The resultant increase in quantity and quality of grazing and forage supplies has enabled stocking rates to increase by 0.5cows/ha and milk yields to rise. Milk from forage has increased by 20% to 5350litres/ha, and MOPF has doubled to £3526/ha.



Beef and sheep farmer, Edward Dean, Kirkhouse Farm, Cumbria

Grassland improvement has made leys more productive: it has increased the 12-month liveweights for store calves from the suckler herd, and the higher stock-carrying capacity has enabled flock number to double from 50 to 100 ewes. Soil nutrient status and pH are now monitored annually so fertiliser and slurry applications can be targeted more effectively. Poor performing leys have been reseeded or overseeded with grass seed mixtures, selected according to field use. Grass growth has further been enhanced by sward-lifting to improve drainage, and harrowing to remove trash and aerate roots.



