BARENBRUG

Sheep

Practical advice for **grass** grazing management

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British sheep farmers

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Good quality grazed grassland is the cheapest feed for ruminant livestock and is the base upon which profitable farming is built. Around 70% of utilisable agricultural land in the UK is given over to grass – making it one of our nations' most important crops.

To help UK farmers get more from their grassland, Barenbrug has created a series of enterprise- and application-specific guides that set out a clear and compelling case for proactively managing grassland performance, whatever the farm focus.

Recognising that market conditions have been difficult for some time, and that farmers have more forage options available to them than ever before, Barenbrug's guides are designed to help UK farmers make the right choices and pick the right products as they work to achieve their grassland goals.

Each guide contains useful information about grassland growth and practical advice on perfecting grassland performance and looking after leys long-term. There are also details about the different grassland management techniques, and varieties and species available to UK farmers. This particular guide assesses the importance of good grassland management to dairy farming. Over the following pages we explore the science behind successful swards and how to manage grassland efficiently to maximise yields and profitability.

Barenbrug - grass experts since 1904.

Barenbrug is one of the UK's largest grass seed producers – breeding varieties for every possible forage and turf application, and distributing more than 4,500 tonnes of seed each year to agricultural, equestrian, amenity and residential markets.

Part of the Royal Barenbrug Group, the company was founded in the Netherlands in 1904 and operates in 16 countries worldwide. With proprietary plant breeding and production technologies, Barenbrug works closely with academic institutes, customers and the international research community to develop improved grass seed varieties. Barenbrug's portfolio includes grass varieties and mixtures that offer improved yield, disease resistance, drought tolerance, palatability, nitrogen efficiency, winter survival, rumen stimulation, protein production, cool-temperature germination, and rapid recovery from damage.

Experts in agricultural grass, Barenbrug has a team of specialists located across the UK. Working closely with farmers, the team provides practical advice to help farmers get more from their grass in terms of yield, quality and persistency.

Barenbrug's UK headquarters are in Bury St Edmunds, Suffolk with additional regional centres in Falkirk, Scotland and Loughgall, Northern Ireland plus trials sites throughout the UK. The company has ISO9001 certification plus Soil Association accreditation for its organic varieties.

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1: https://www.gov.uk/government/statistical-data-sets/structure-of-the-livestock-industry-in-england-at-december

2: https://www.nationalsheep.org.uk/know-your-sheep/uk-sheep-farming/

UK SHEEP INDUSTRY FACTS AND FIGURES

UK farmers produce some of the best lamb in the world. As of June 2017, there were reported to be just over 34.6 million sheep in the UK – a rise of 2% on the previous year[1].

All regions of the UK saw an increase in both breeding ewes and total sheep numbers. Northern Ireland's flock rose 2% to 2.1 million – a figure not seen since 2006. Scotland's flock was up 160,000 to 6.99 million. While in Wales, the country's flock was up 2.3% to ten million.

The UK's sheep population is made up of many different breeds. In fact, there are thought to be more sheep breeds in the UK than in any other country in the world. The sheep sector is stratified with different breeds distributed across the UK – depending on geography, environment and habitat.

Hill sheep breeds include the Scottish Blackface, Cheviots, Swaledales and Herdwicks, among others. They are maternal breeds with very thick fleeces that enable them to withstand extreme weather conditions. They make excellent mothers, are good foragers and are able to survive on poorer grasslands. Their role within the sheep industry is as breeding stock to maintain the hill populations and contribute to upland systems. Generally, ewe lambs are retained or sold for breeding whilst ram / tup lambs are sold as stores to finishers unless the producer has some lower ground to finish them at home.

Upland flocks often have 'mule' females as the predominate mother. These are ewe lambs out of hill breeds and sired by a long wool breed such as the Bluefaced Leicester or Wensleydale. These ewes are more prolific and have slightly higher input needs than hill breeds but have retained a strong mothering ability. They are better suited to lower ground where grassland quality is better because management is easier. Again, males tend to go into the food chain with ewe lambs carrying on down the hill to low ground systems or if a hill ewe has been brought 'in-bye', her lambs may also be retained for the upland flock. Many upland systems will finish a proportion of the lambs with the later, small end often being sold as stores.

Lowland flocks tend to be based around more paternal, carcass breeds such as the Texel, Suffolk and Charollais. These breeds grow fast and have a larger frame for meat production. The breeds are also reasonably prolific and crossed with an upland type ewe can produce lambs with excellent ability to convert grass to meat and thrive in the most favourable conditions. With a lowland system it is typical to finish lambs right through. Some may not keep any ewe lambs at all and often there are pedigree breeding enterprises involved too.

A SHIFTING LANDSCAPE

Uncertainties over Brexit mean that the next few years are set to remain challenging for UK sheep farmers. While it's almost impossible to influence external market factors, producers need to find alternative ways to maximise the efficiency of their operations to ensure that their business remains as profitable as possible.

The past 18 months have seen farm gate prices improve across the board in the ruminant sector – with lamb prices reaching record highs. With imports down, consumers are buying more UK produced foods than ever, which is helping to improve cash flow for farmers.

This trend is likely to continue for the foreseeable future with current exchange rates and a lack of clarity about the implications of Brexit. In parallel, consumers are showing more interest than ever in the provenance of food, animal welfare standards and food hygiene and safety.

With a bit more money available, now is the time for farmers to 'mend the fences' – in other words, invest in those things that have not been a priority for the last few years. For farmers looking to make improvements, increasing on-farm food production – e.g., growing more grass – is an obvious place to start.

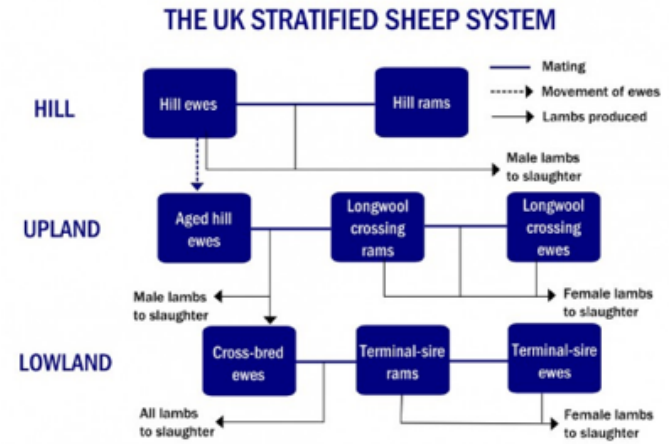


Image from National Sheep Association[2]

REASONS TO INVEST IN GRASS

Regardless of breed or location, all UK sheep farmers have one thing in common: the need to provide their animals with grass to eat, whether grazed or silaged.

In sheep production, where margins are incredibly tight, high quality grass can be the key to profitability – so keeping a constant supply in front of livestock makes sound financial sense.

Essential to the production of lamb, grass is a cost effective form of feed that can be utilised all year round – in spring and summer by grazing livestock; and in winter as silage.

On average, a good crop of silage will cost around £30 per tonne to produce; while hay is around £75 per tonne; and grazed grass costs just £15 per tonne (fresh weight).

Costing far less than manufactured animal feed, well-managed grassland can supply almost all of the energy and protein requirements of a sheep flock.

Consumers are also waking up to the benefits of feeding grass to livestock. Over the last few years there has been an increase in demand for produce from animals that are 100% grass-fed. With a pull from the market, many of the UK's leading supermarkets and producers are starting to introduce ranges of meat and milk from animals that have a 100% grass-based diet or are out in the field for at least six months of the year.

GRASS GROWING THE FACTS

Providing major health benefits for animals, as well as improvements in dairy produce quality, good grassland management can have a positive impact on farm finances. It can also be beneficial to the environment.

- Growing grass and other grassland crops is cheaper than buying in manufactured feed
- Grazed livestock will typically produce a better output per hectare, which will help profitability
- Animals fed on grass tend to be healthier and require less veterinary attention
- Enabling animals to graze for longer can reduce labour, machinery and housing costs
- Grazing animals recycle nutrients back into the soil through dung and urine
- Growing clover alongside grass fixes soil nitrogen, reducing the need to buy in fertilisers
- On mixed farms, growing grass in between other crops can help improve soil structure
- Farms that graze livestock have a lower carbon footprint than those that buy in food
- Growing grass makes farmers more self sufficient and less reliant on feed suppliers
- Produce from grass-fed animals is recognised as being high quality and can often command a premium.

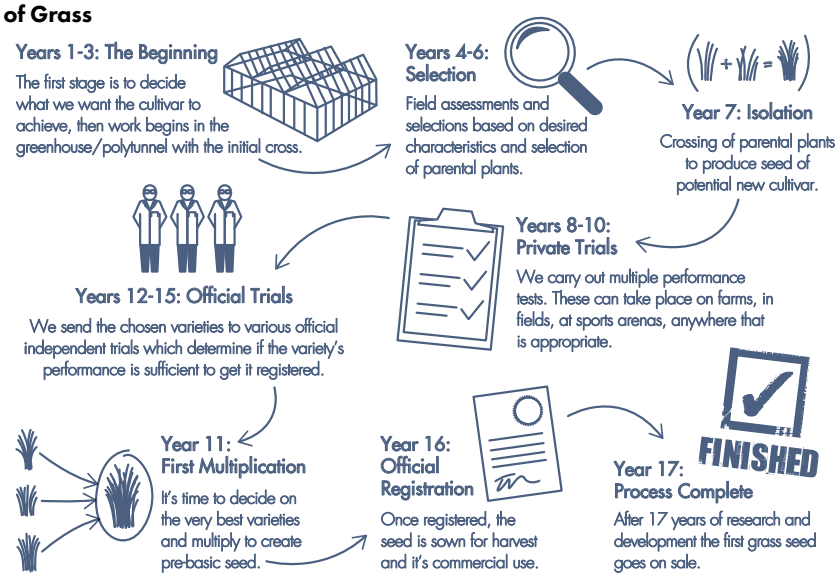
THE SCIENCE OF GOOD GRASS

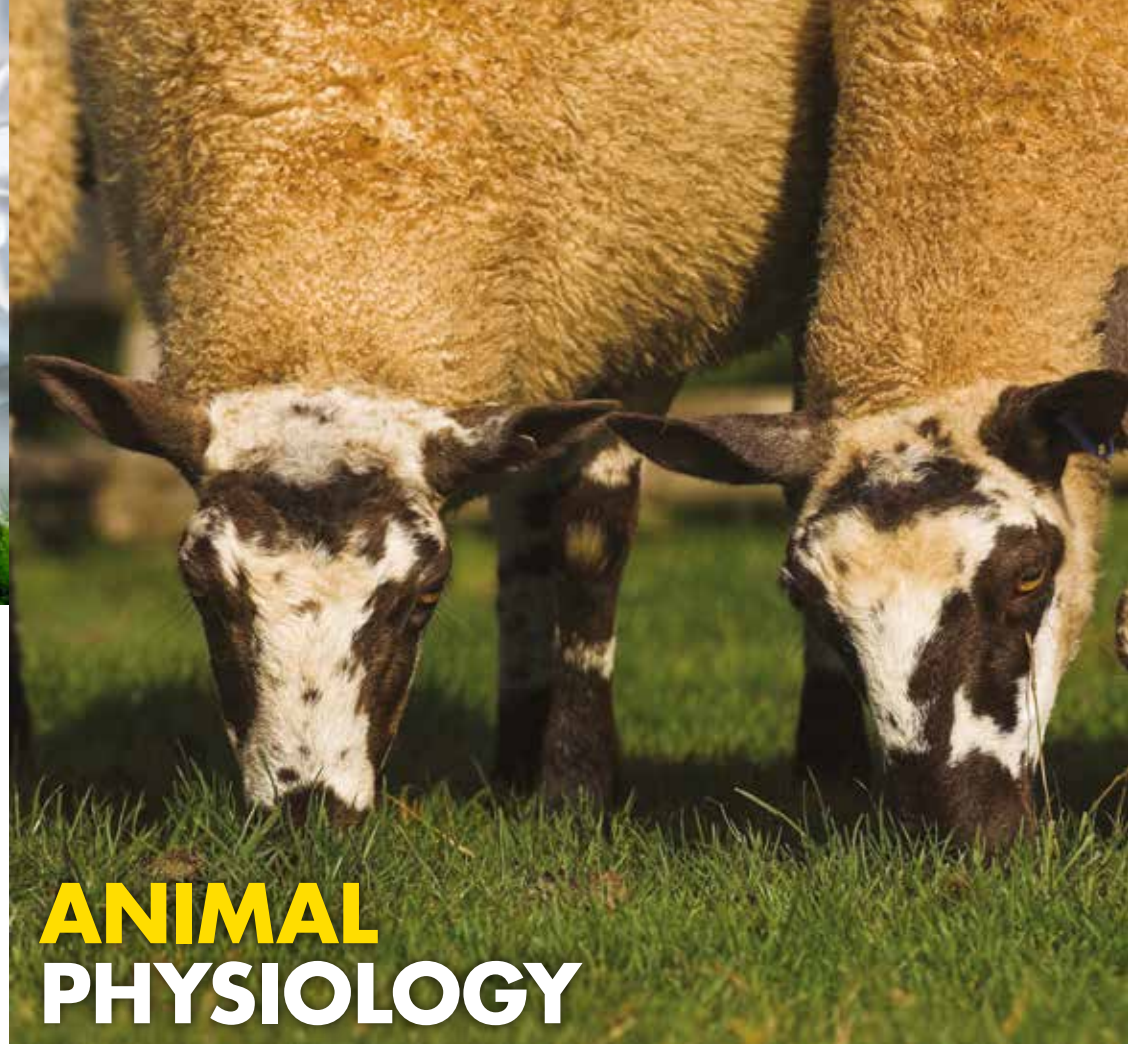
The UK has the ideal climate for growing grass. Ryegrass grows best at between 5ºC to 25ºC – and most of the UK is between these temperatures 95% of the time.

Like all other crops, growing grass requires careful management to ensure yields and utilisation are good. It is a science – but a relatively simple one to grasp once you have a basic understanding of plant as well as animal physiology.

Armed with information about how grass grows and the different species and management techniques available, it is easy for farmers to make informed choices about what kind of grass to grow; when to sow it; when to graze it; how long to graze it for; and what to do to ensure its performance long-term.

The Story of Grass





ANIMAL PHYSIOLOGY

Sheep are highly efficient at turning grass into protein and find it easier to digest than manufactured feeds. Like other ruminant animals, sheep like to spend much of their day feeding. In fact, they are most efficient when small volumes of forage travel through their digestive system throughout the day.

A sheep's digestive system is around 27 times longer than its body length and because a sheep has no upper incisor or canine teeth, it will tend to tear at grass rather than bite it. Sheep have flat molars and their jaws work in a circular motion meaning they grind feed material as opposed to biting through it.

A lamb's rumen is fully developed from around 20 kg. After this point, the animal can receive almost all of its nutrition from forage – as long as it is well managed. A sheep requires RDP – rumen degradable protein - for rumen microbes in order to break down forage and release the energy locked up in the grass. They key to success is reducing times of grazed forage deficit throughout the year, which will vary dependant on climate and soil types.

At different stages of development, the nutritional requirements of sheep will vary.

BREEDING EWES

At different stages of development, the nutritional requirements of sheep will obviously be different.

Pre-tupping, ewes should have at least eight weeks without lambs at foot in order for them to replenish body reserves and body conditions scores. Depending on the breed, at tupping, ewes should be have a body conditioning score (BCS) of between 2.5 and 3.5 and should be on good grazed grass that is around 4-8 cm high, providing up to 2800 kg DM* / day cover – depending on the season. When flushing ewes – to increase ovulation rates – typically two to three weeks before breeding, you should bear in mind that one unit of condition score adds approximately 13% of the live weight of the ewe. While 1 kg of weight gain requires around 55MJ of energy to be consumed.

At tupping, and through the first trimester, a level plane of nutrition should be kept. Ewes will need around 8 MJ of energy per head per day. During the second and third months of pregnancy, it is vital not to allow ewes to change their BCS by more 0.5 in order to prevent or impair placental development, which would ultimately affect lamb birth weight.

Late pregnancy (the last six weeks) is when 70% of foetal growth occurs. However, during this time, a ewe's intake potential can drop by as much as 30% due to lack of room. It is vital therefore to provide very high quality, nutrient dense feeds. This is the point at which supplementary concentrates should be offered alongside adlib, high quality forage and clean water. Digestible, un-degradable protein (DUP) is essential in the last three weeks of pregnancy for ewes to produce milk. DUP does not break down in the rumen but is absorbed directly from the intestine. Again, you should be careful to ensure that a ewe's BCS does not change by more than 0.5.

From lambing to weaning is when most demands are placed on the ewe. Her appetite will typically increase by 50%. Energy requirements can be up to four times over maintenance for a twin bearing mule ewe at peak lactation (3-4 weeks after lambing).

Ewe status	DM intake (% of bodyweight)
Maintenance	1.5
Late lambing	2
Early lactation	3
Mid - Late lactation	2.5 -2

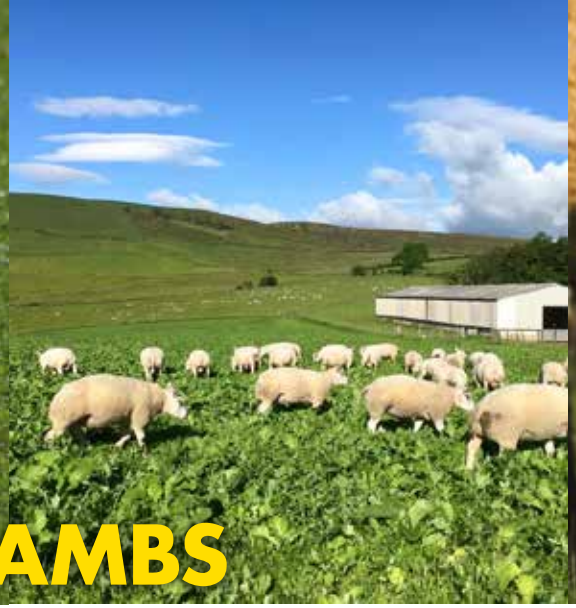
For tups: Pre-breeding, tups should be built up to as much as BCS 4 before being turned out with ewes. Post tupping, the aim should be for tups to reach BCS 3 again with the additional help of concentrates if necessary.

YOUNG LAMBS

From birth to eight weeks old, a lamb should be achieving an average daily live weight gain (DLWG) of 250g. If this isn't happening, you will need to discover the reason. For example, there could be a problem with a parasite or poor milk yields. Once a lamb has reached around 20kg, its rumen will be fully developed – meaning it can get all of its energy requirements from grass as opposed to milk.

Ideally, lambs should be weaned at around 12 to 14 weeks. Where grass is plentiful and of high quality, weaning can be delayed at no cost to lamb DLWG. However where grass is in short supply or of poor quality, ewes and lambs will start to compete for the same forage. In this scenario, lambs should be weaned early and moved to better grazing to prevent lamb DLWG dropping below 200g.

Interestingly, research has shown that lambs that receive significant diet changes (e.g. they are introduced to red clover or chicory finishing mixes) or stresses (e.g. worming or vaccinating) before weaning, go on to perform better after they are weaned. Remember, a sheep's rumen can take three weeks to fully adapt to a new diet so if the plan is to finish lambs on something other than grass and white clover, it may be worth considering introducing this pre-weaning.



FINISHING LAMBS

Finishing lambs, whether homebred or bought in store can be classified into three management groups:

Long keep: Smaller lambs up to 30kg, which will need at least three months to finish.

Medium keep: Lambs 30-35kg, which will take somewhere between six to twelve weeks to finish

Short keep: Lambs over 35kg, which will finish in less than six weeks.

A base line target for grass-based breeding systems is to have at least 70% of the lamb crop sold off the farm by tupping time. That could be finished or as stores. Having this goal will help ensure lambs are not 'stealing' forage from ewes. It will also help ewes return to peak condition pre-tupping to ensure a viable lamb crop the following year. If it looks like forage supplies are getting tight, it may be worth selling long-keep lambs as stores rather than buying in expensive concentrates to fill the deficit. This will need to be budgeted for annually depending on store trade and feed prices because these will fluctuate more throughout some seasons than others.

Lamb finishers should ask themselves a number of questions to plan an accurate finishing system for their enterprise: Who will be buying the lambs? Will they be sold live weight at a market or to a butcher for example? When do they need to be ready by and how many do I need? What type of lamb is required? These questions are particularly important for the person buying in stores to be able to match supply and demand and purchase the appropriate animals.

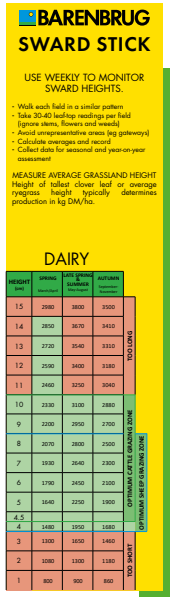
Grass of 6-8 cm is ideal for weaned lambs in a set-stocking situation. For those using rotational grazing, paddocks should be entered at ten to twelve cm long (and grazed to leave a five cm residual). These heights will ensure that well managed grass is mostly leaf with minimal stem – so maintaining a metabolisable energy (ME) value of 11.5 MJ/kg DM and above. Grass of this quality can achieve DLWG of 250g/day.

The use of white clover will boost protein and digestibility of grazing swards and a 30% clover content can speed up finishing times by 25% compared to grass only swards.

The fattening period will vary across the geographical regions and within each farming business however it is likely that some finishing will be occurring over autumn and winter when grass productivity will not be as high and the DLWG potential greatly lessened. The use of stubble turnips or forage rape can achieve very similar DLWG in lambs. Kale has less fattening potential however the crop is there longer so my suit longer keep systems looking to achieve 150 -175g/day.

WINTERING HOGS

Many cattle farms take in ewe lambs / hoggs from late autumn until early spring to use as a grass management tool. Grazing swards with sheep has several benefits. It encourages tillering and removes any excess growth, which can go rank, lodge and rot out. It can also be very useful for reducing weed pressure. On silage ground, sheep dung and urine can also add useful nutrient and organic matter contributions.



BARENBRUG
SWARD STICK

USE WEEKLY TO MONITOR SWARD HEIGHTS.

- Walk each field in a similar pattern
- Take 30-40 leaf-top readings per field (ignore stems, flowers and weeds)
- Avoid unrepresentative areas (eg gateways)
- Calculate averages and record
- Collect data for seasonal and year-on-year assessment

MEASURE AVERAGE GRASSLAND HEIGHT
Height of tallest clover leaf or average ryegrass height typically determines production in kg DM/ha.

DAIRY

HEIGHT (cm)	SPRING (March/April)	LATE SPRING & SUMMER (May/August)	AUTUMN (September/November)	
15	2980	3800	3500	TOO LONG
14	2850	3670	3410	
13	2720	3540	3310	
12	2590	3400	3180	
11	2460	3250	3040	
10	2330	3100	2880	OPTIMUM CATTLE GRAZING ZONE
9	2200	2950	2700	
8	2070	2800	2500	
7	1930	2640	2300	OPTIMUM SHEEP GRAZING ZONE
6	1790	2450	2100	
5	1640	2250	1900	
4.5				
4	1480	1950	1680	
3	1300	1650	1460	TOO SHORT
2	1080	1300	1180	
1	800	900	860	

SWARD STICK

Knowing when to graze grass and for how long requires careful judgement. To help farmers gauge when to graze grass, we've developed a brand new sward stick, which is available completely free of charge. Printed with the optimum heights for grass for both sheep and beef, the sward stick is designed to help growers decide when to turn livestock out, and when to adjust grazing pressure.

We recommend using sward sticks on a weekly basis – to build up a log of grass growing information. Farmers should walk each relevant field, once a week, to monitor sward height. Following a similar route each time, they should take 30 to 40 leaf-top readings per field – before calculating an average and recording it in a notebook. This information can then be used to aid decision-making and for longer-term seasonal and year-on-year assessments and adjustments.

We've created sward sticks in the past and they've proved really popular so make sure you get hold of yours quickly. To find out more, visit our website, www.barenbrug.co.uk

PLANT PHYSIOLOGY

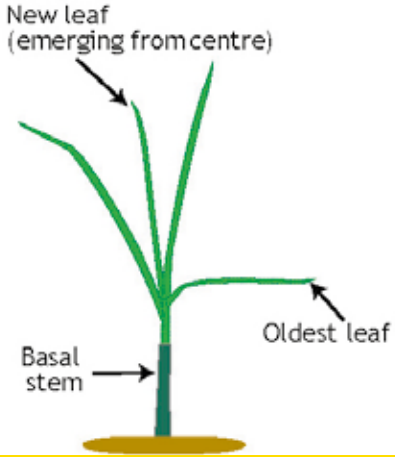
In the UK, perennial ryegrass is the most widespread species of grass for grazing animals. A perennial ryegrass field is made up of a population of ryegrass tillers. A tiller is made up of a basal stem, a leaf sheath and – at any one time – three growing leaves.

When the tiller has developed three leaves it will continue to grow. As a fourth new leaf is produced the oldest leaf starts to die. Then a fifth leaf is produced and the second leaf dies – and so the process continues.

Tillers are largely individual but are clumped together, meaning they can (to some degree) exchange nutrients. The average field will contain between 3000 to 5000 tillers per square metre.

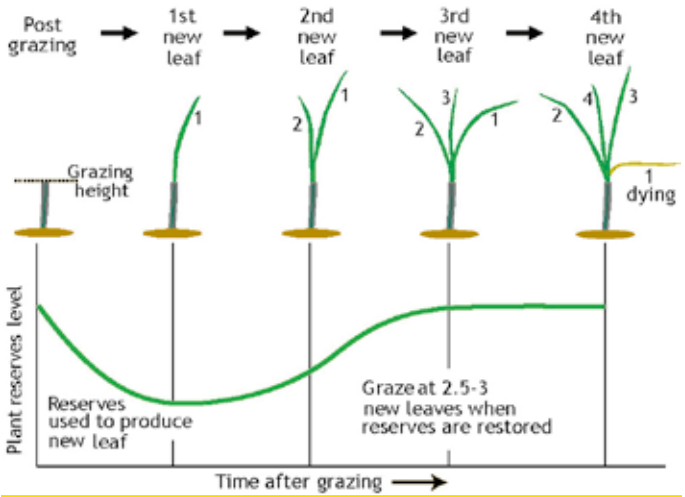
Perennial ryegrass plants will produce new tillers throughout the growing season with peak production occurring from late April to July. The time it takes for a tiller to produce three leaves will vary, depending on the plant, the local climate and the time of year.

Ryegrass clump



Ryegrass tiller

In mid spring it may take 15 days for a tiller to produce three leaves, with a new leaf produced every five days thereafter. In colder periods, it may take up to 50 days for a tiller to reach the three-leaf stage, with a new leaf produced every 17 days.



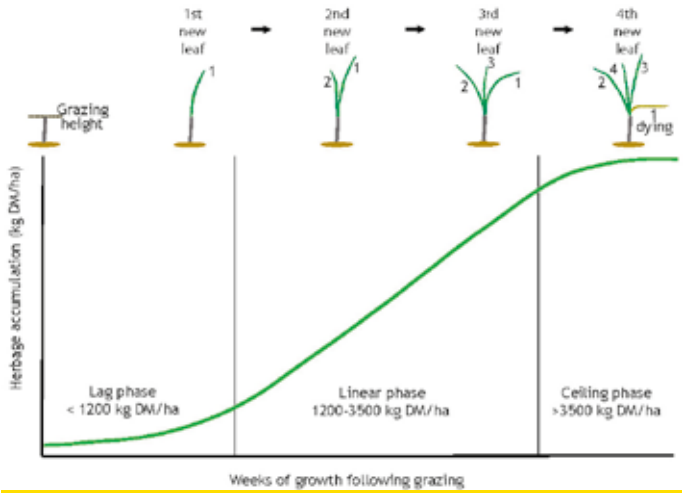
Tiller leaf production

Typically, fields grow in three phases, working in line with tiller production and energy reserves:

- The lag phase – where grass is typically less than 1200kg DM / ha
- The linear phase – where grass is typically between 1200 and 3500kg DM / ha
- The ceiling phase – where grass is typically above 3500kg DM / ha.

During the lag phase the tiller grows its first leaf; in the linear phase the second and third leaves develop; and in the ceiling phase the fourth leaf develops and the first leaf starts to die off.

When striving for peak grass performance, the aim should be to maintain grass growth in the linear phase of development, where high net growth rates and high grassland quality are achieved.



Three phases of grassland development

GOOD GRAZING MANAGEMENT

Good grazing management relies on keeping grass plants leafy and actively growing while matching supply to livestock needs.

The best time to graze ryegrass is when there are two and a half to three leaves per tiller in place. This new growth is a sign that the plant has sufficient reserves to recover quickly from defoliation.

Grass grows by storing the energy it produces through photosynthesis as carbohydrates in its stems. Once the first tiller leaf is established, photosynthesis becomes the main energy source, providing energy for the growth of subsequent leaves as well as replenishing carbohydrate stores.

In the phase immediately after grazing, when tiller leaves have been eaten, plants must mobilise stored carbohydrates to provide energy for regrowth. It is therefore important that the tiller has had adequate time to replenish its reserves.

How animals are managed on fields can have a major impact on forage production and persistence as well as animal production. The most important factors for influencing the level of animal output under grazing are:

- The concentration of animals per hectare/acre (stocking rate)
- The system of grazing management
- The intensity of grazing pressure.

Grazing pressure – the closeness to which a pasture is grazed – is affected by the stocking rate and the amount of available forage (kg of forage per hectare / acre).

In sheep enterprises do not graze beneath 4cm and do not be tempted to graze too early as the plants will not have accumulated enough energy reserves. In the long term, all this would achieve is to reduce pasture quality and persistence. If you are unsure about grass levels, try using a sward stick – see page 13.

PERFECTING GRASSLAND PRESSURE

The key to maximising profitability within a sheep enterprise is to reduce the grazing deficit periods as much as possible for both the ewes (if applicable) and the lambs. Conserved grass (either hay or silage) can equate to three times as much as the cost of grazed grass but will still work out less expensive than feeding excess concentrates - so well managed conservation areas should also be taken into account when feed budgeting.

As previously mentioned, leafy grass can be well over 20% CP and have an ME of 11.5 MJ/kg DM. The relationship between the D value of a grass to ME is 0.16. To have 11.5 MJ/kg DM available, a grass plant must be 71.8% digestible. Managing grazing heights closely means that a sward is more likely to maintain that leafy growth and not become too mature and put out a seed head, which will reduce the over digestibility and therefore energy and protein available to the grazing sheep.

Managing grass to the advised heights throughout the guide, particularly for ryegrass, will maintain the levels of live fresh leaf up to the three leaf stage (see page 14) and minimise both seed heads and older, dead material at the base of the sward.

An added benefit of having animals graze ground is that they recycle nutrients back into the whole area through dung and urine. Where they rely on larger volumes of silage or concentrate, more time is spent in smaller areas, putting more nutrients here but also putting more pressure on soil structures.

One way to bridge forage deficits is to introduce brassicas into the rotation. As well as plugging gaps in forage supplies, they offer an effective way to reseed back to grass and put some management into the ground.

Short-term brassicas such as stubble turnips and forage rape offer a low-cost option for rapidly growing feed, which can be used to fill in summer dry deficits or to extend the grazing season further through autumn and early winter. Longer-term options, such as Kale, can provide large quantities of feed throughout the winter and into the New Year.

GRASS WHEN TO GRAZE

Knowing when to graze grass and for how long requires careful judgement and it is wise to conduct regular visual checks of the number of tillers present to avoid problems.

Grazing too early

On a new ley, grazing grass too early – before a second new tiller leaf appears – can damage grass persistency. If a plant's reserves have not been fully restored, future growth will be in jeopardy. Repetitive early grazing can permanently decrease grassland yield and persistence. Grazing grasslands at the right time is especially important through dry summer periods when plants are under stress; grazing the first new growth after a period of drought and before a tiller has two and a half new leaves in place can kill grass.

Grazing too late

If grassland is left to grow too long (>3500 kg DM / ha) it will enter the ceiling phase of grassland growth. In this phase, tillers continue to produce new leaves, however, there is no further increase in net grassland mass due to the dying off of older leaves. If grassland isn't grazed, dead material, which has little feed value, will build up in the base of sward. This can lead to:

- Reduced grassland ME
- Increased risk of disease – rust and other forms of fungi can build up on dying leaves
- Decreased grassland utilisation – due to the factors above
- Reduced clover content – due to shading.

TRY THE PLUCK TEST. Grasp the ryegrass seedling firmly between your thumb and forefinger, then tug in a single, quick movement (to mimic an animal biting). If the leaves break off and the roots stay in the ground, the pluck test is passed. In the photos above: Left: Roots being pulled from the ground. Right: Leaves breaking = a good time to start first grazing.

In the photo above:
Left: Roots being pulled from ground **Right:** Leaves breaking = a good time to start the first grazing.

ADJUSTING GRAZING PRESSURE

Correcting high grazing pressure

If grazing pressure becomes too high – e.g., if there are too many animals grazing the same area of grass for too long – the result will be short grass stubble, which will ultimately affect animal performance. With short grass stubble, cattle are forced to consume all portions of grass including poorer quality forage. This can lead to low animal intake and subsequently, low gain rates. Periods of excessively high grazing pressure can result in a decrease in grass production.

Grazing a field to a low residual, where there is too little grass left, can put it back into the lag phase – where regrowth is slow due to the plant's sole reliance on its carbohydrate reserves. Where high grazing pressure needs to be relieved, the most effective option is to remove some animals from the grassland by allowing access to other fields. Feeding concentrates or buffer feeding the animals on grassland with silage are other options.

Correcting low grazing pressure

With low grazing pressure, animals gain per head per day will typically be higher but production levels per hectare/acre will be poor. Put simply, low grazing pressure is likely to result in wasted forage. As with prolonged periods of high grazing pressure, extended phases of low grazing pressure can damage a sward, causing a loss of legumes from the stand. Where there is a need to increase grazing pressure this can be achieved by intensifying the stocking rate or by temporarily fencing out part of a field for silage.

Short periods of high grazing pressure can be useful; one to two weeks of high grazing pressure, three or four times throughout the grazing season, can help maintain legumes in the stand and utilize forage that might otherwise be wasted.

Other options for using up grass that's not being grazed quickly enough might include round baling swards. This can bring the field back under control while creating a useful buffer feed for later in the season when grazing pressure may exceed grass growth. If fields are under grazed and growth gets ahead of the animals, topping with a rotary mower or topper to remove tall, rank vegetation and encourage new growth can also be helpful.

DIFFERENT GRAZING METHODS

Sheep tend to follow the leaders of the pack - so they will all graze at the same time and sleep at the same time within a field / flock. If you pull out leaner animals and graze them together they will have a greater appetite and will eat for longer therefore improving the condition of these animals more quickly.

Sheep farmers face a number of choices when it comes to managing how their animals graze grass. Typically, grassland growth rates should determine how long grass should be grazed and rested for and will therefore have a bearing on the grazing method chosen.

Growth rates are influenced by a number of factors including season, weather, soil structure and soil nutrients, and may vary from field to field, and even within individual fields – depending on size, geography and the stocking rate.

The Agronomy Guide has developed the following table as a rough guide to rest periods at different times of the year.

Season	Weather	Growth rate	Rest period
Spring	Cool and moist	Fast	10-14 days
Spring	Warm and dry	Medium	14-20 days
Summer	Hot and moist	Slow	30-35 days
Summer	Hot and dry	Very slow	40-60 days

ACTIVELY GRAZING GRASS FOR IMPROVEMENTS

Continuous grazing:

With continuous grazing, a fixed area of land is normally grazed non-stop for a specific period. Time-frames vary from just a few weeks to the entire grass-growing season. Continuous grazing can be controlled or uncontrolled. To maintain a productive field in an uncontrolled, continuously grazed system it's important to avoid under- or over-grazing by maintaining the correct grazing pressure and adjusting stocking rates accordingly.

Continuous grazing can lower grass production and persistency so it's vital to pick a suitably hardy grass variety. It's also important to ensure that a field used for continuous grazing has more than one water source. Animals like to gather around watering points, which means recycled nutrients can become concentrated in one area. Providing multiple drinking points will ensure nutrients get evenly spread across a wider area. Having more than one water trough will also help minimize poaching when conditions are wet.

Rotational grazing:

Rotational grazing is where fields are subdivided and then grazed and rested alternately. Once one field has been grazed, livestock are moved to a new patch of grass. The first field is then rested and the sward given time to regenerate. Some farmers have a rotational grazing pattern of one to two weeks. Others opt for a more intense approach – moving livestock every few days. This method provides more control over what animals are eating and can result in better plant growth but requires more land and can be time consuming from a land management perspective.

Creep grazing:

Creep grazing is when young animals are allowed to move onto an area of grass ahead of older livestock to gain access to better quality forage. This method of grazing works well within a rotational grazing system, giving lambs access to the top layer of more succulent, nutritious grass, which enables them to gain weight more quickly. Creep grazing is typically managed via a series of fences or gates that only allow smaller animals into a designated area first.

Mixed grazing:

Grazing different animals together can have huge benefits in terms of grassland management and can increase grass utilisation. Different species of livestock prefer different types of forage and have different in-take levels. Sheep will generally always opt for immature grasses and weeds over legumes, while cattle generally prefer legumes to grasses. Cattle and sheep also eat differently. While cattle use their tongues to pull and tear, sheep use their teeth to nibble, grazing much closer and getting into parts of the pasture that cattle either ignore or can't reach. This can increase grass tillering and sward productivity – meaning animals will, long-term, gain more weight.

SILAGE PRODUCTION

Where silage is used to finish lambs inside, growth rates of up to 150g / day can be expected although these can rise with concentrate supplementation. The best results come from using silage with a short cop length, which speeds digestion in the rumen and improves intakes, D values of over 68%, dry matter of over 25% and energy values of 11 ME. The drawback of silage is the risk of listeriosis, (a bacterial infection) and, in an indoor finishing system, the increased requirement for bedding.

Silage can also be a very important part of the ewes ration but only the very best quality pit and bale silage should be used to reduce the risk of listeriosis, which is non-contagious but can cause encephalitis, abortion and liver damage. Removing wasted silage daily can also help. You should also always ensure that all ewes have plenty of access to the silage and any concentrates fed as well as a clean water supply.

It is critical to have silage analysed so diets can be properly formulated to meet ewe requirements. You should also evaluate whether you have enough silage for all the farms' demand. If you haven't, you'll need to decide whether to buy in other forage, where to allocate the best forage and how much more concentrate will be required.

To help livestock farmers produce greater quantities of silage - of a higher quality - we are developing a separate guide to silage production, management and utilisation. For more information or to obtain a copy of the guide when it is published, please visit our website.

GRASS SEED QUALITY
IMPORTANT FACTS TO CONSIDER WHEN BUYING SEED

RESEARCH

Few farmers would rely on genetics from the past for livestock breeding but many stick with the same grass seed varieties and mixtures year after year – even if they aren't delivering the best results.

For some farmers, the prospect of picking a new grass can seem daunting. There are hundreds of different varieties, blends and mixtures available – so how do you know which one will work best?

If you are unsure about which product to pick, we advise selecting a grass seed from one of the UK's Recommended Lists. Bred to perform in UK conditions, grasses included on Recommended Lists have been have been tried and tested by farmers, who've seen real results.

As a starting place, perennial ryegrass remains the most popular form of grass for grazing animals in the UK. But there are many other varieties that the farming sector relies on including clover, herbs and other forms of forage crops. Used in conjunction with modern grass varieties, in specially devised blends and mixtures, these can bring big yield benefits – giving animals additional essential vitamins and minerals to help weight gain, while also reducing nitrogen fertiliser requirements.

Over the following pages we've put together a quick guide to the main species available, and most beneficial to UK sheep farmers.

Species	Description	Min germ temperature	Seeds/kg
RYEGRASSES	All ryegrasses are capable of producing high yields of very high quality, high-energy grass for cattle grazing. They are all very flexible and can be used for both cutting and grazing. They are very effective users of nitrogen but must be maintained well to maximise productivity.		
PERENNIAL RYEGRASS *Lolium perenne*	The most popular grass used for dairy enterprises. Generally persistent for up to five years.	7-8°C	600,000 (dip) 290,000 (tet)
HYBRID RYEGRASS *Lolium perenne*	Can extend the shoulders of the grazing season. Hybrid grasses are also persistent for three to five years depending on genetic capabilities and can produce up to 10% more dry matter than perennials.	5-6°C	450,000 (dip) 269,000 (tet)
ITALIAN RYEGRASS *Lolium multiflorum*	Generally found in short-term silage mixtures, it is a two-year species that grow to temperatures as low as 3-4°C and can extend the grazing season by three to four weeks in spring and autumn. Italian ryegrasses are capable of producing up to 20% more dry matter than perennials.	4-5°C	430,000 (dip) 265,000 (tet)
WESTERWOLD *Lolium mul. westerwoldicum*	Rapidly establishing annual species which gives high productivity within 12 months of sowing. This species is useful for sowing immediately after maize or cereal harvest in autumn or in spring, when high yields are required within 3-6 months of sowing.	3-4°C	400,000 (dip) 221,000 (tet)

Species	Description	Min germ temperature	Seeds/kg
CLOVER	Clover fixes nitrogen in the soil (figures of 170-220kg N/ha/yr are achievable) -- and is therefore a very valuable species in efficient grassland management.		
White Clover	An absolute essential for any grazing livestock system. This perennial species provides 'free' nitrogen, which has been fixed from the atmosphere, and can feed companion grasses. Adding white clover to grassland can increase sward digestibility, especially in the summer period. It can also improve grass protein levels and trials have proved increase intakes on grass / clover swards compared to grass alone.	9-10°C	1,500,000
Red Clover	Red clover is a useful plant for lactating cows and can help boost milk production but should be avoided by pregnant and breeding animals. When well managed, red clover can persist for up to five years, fixing around 50 kg N/ha/annum more than white clover. Usually sown with Italian ryegrass in short-term leys, it can also be sown with perennial and hybrid grasses to extend the lifetime of a sward by helping to suppress weeds. Red clover is typically quicker to establish than white clover although not as long lasting or tolerant of poorer conditions/management.	9-10°C	520,000

SEED QUALITY
IMPORTANT FACTS TO CONSIDER WHEN BUYING SEED.

RESEARCH

Species	Description	Min germ temperature	Seeds/kg
OTHER GRASSES			
TIMOTHY *Phleum pratense*	A very useful perennial species within grazing leys, timothy grass is much or tolerant of colder wetter soils. A very small seed means per kg, a high number of seeds are available resulting in a high plant population for wear tolerance and productivity. Timothy generally yields around 85% of ryegrass and is very palatable.	7-8°C	4,000,000
COCKSFOOT *Dactylis glomerata*	Modern, soft leaved varieties of cocksfoot are highly digestible, palatable and yield well. They are ideal in drought prone areas as they can persist well in these conditions and help fill the 'summer gap'. The growth habit can be strong so cocksfoot grass is ideal for systems requiring high dry matter yields early in the year. Cocksfoot is perennial and will produce as much ryegrass on lower Nitrogen applications and really comes to the fore in clover only situations making it ideal for less intensive systems. Can be a useful species where conditions are less favourable.	7-8°C	960,000
TALL FESCUE *Festuca arundinacea*	Modern soft leafed tall fescues are very digestible, palatable and high yielding much like the modern cocksfoot varieties. They are perennial and their aggressive root system can grow to over 6' deep where soil conditions allow making them very useful in both light, dry soils and heavy, wet soils. Tall fescue is more responsive to Nitrogen fertiliser than cocksfoot however also performs very well under a clover based, lower input system. Can be a useful species where conditions are less favourable.	7-8°C	420,000

BRASSICA AND FORAGE CROPS

Brassica crops such as stubble turnips, kale, forage rape, grazing turnips and swedes can provide a nutritious, cost-effective form of feed for sheep. A very useful addition to a sheep farmers grazing portfolio, they can fill any gaps where there may be a deficit in grass supply. For example, they can provide a late summer supplement to grass in a dry season; extend grazing over autumn and winter months; and provide a winter feed for animals kept out or housed. They can also be strategic crop within a reseeding programme between two grass leys.

Stubble turnips and forage rape are the two main short-term crops, which are ready very quickly. These species are best utilised in summer, autumn or early winter. Kale, a main crop brassica, is commonly used for winter feed post-Christmas and has a much longer growing season. As a result it can produce more than twice as much dry matter as short-term brassicas.

Stubble turnips - a flexible crop which can be planted any time after soils reach 8°C and will be ready to graze in ten to twelve weeks. As well as providing 5-6tDM/ha of feed, a stubble turnip crop offers an excellent break between grass leys. The leaves are high in protein and the bulbs are high in energy. A typical crop will yield 4tDM/ha with an ME of 10-11 and a protein level of 17-18.

Forage rape - another flexible crop which is ready 12-14 weeks after planting, again when soils reach 8°C or higher. Forage rape can offer a second grazing if the first is light and doesn't consume the growing points. The leaf is high in protein 19-20% with yields of 4tDM/ha being achievable in the UK.

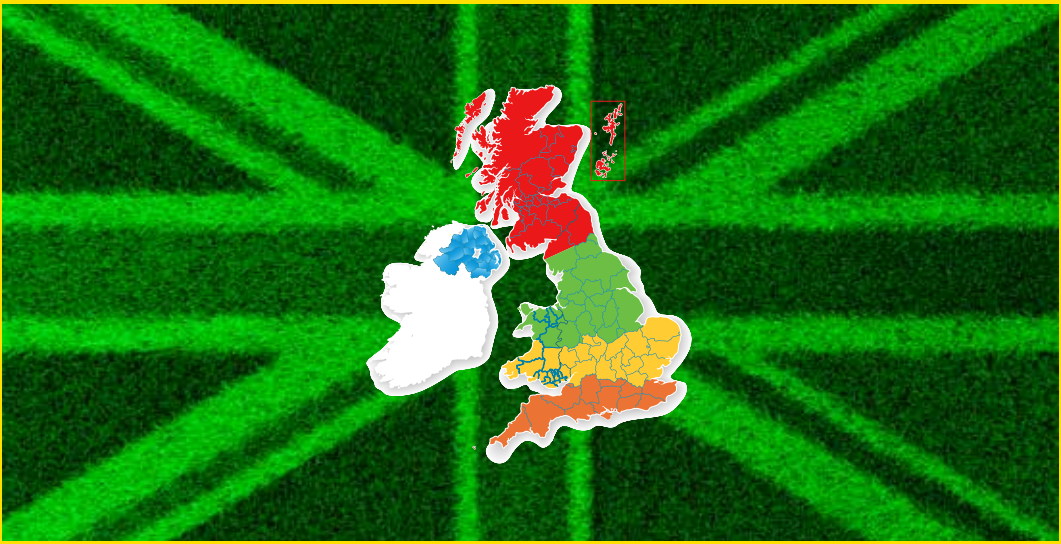
Kale - a main crop brassica, kale is ready to graze after five to six months. Smaller, shorter kales such as Keeper are best for sheep and the large dry matter production (8-10tDM/ha) can sustain flocks throughout the winter. Sown earlier (April/May) kale can also provide a large summer forage crop when grass can be limited. Kale is a high quality feed with 14% CP and 10 – 11 MJ/kg DM of ME.

Bar Finisher is a blend of chicory and plantain, two commonly used forage herbs alongside red and white clover. The clovers are ideal companions for the broad leaved herbs as they provide some of the nitrogen required for the large green leaf area meaning less bagged N is needed. Deep rooted, high in Protein and minerals, Bar Finisher can be sown as a short term green manure or used for 2 – 3 years for grazing livestock.

When choosing a brassica, sheep farmers should ensure that the crop selection matches the livestock class and then decide when the crop needs to be available and work back from there to establish a sowing date.

Caution must be also exercised when feeding brassicas. A clean water supply should always be available as should a fibre and mineral source. In-lamb ewes should not graze brassica crops due to the risk of goitre, or the blocking of iodine absorption, which can cause fertility issues and stillbirths. Brassicas should be introduced gradually and responsibly with adequate fibre sources and non-hungry animals. Low/no sulphur fertilisers should be used on a brassica crop to prevent sulphur toxicity or red water, which is a particular problem in kale crops. Soil tests should be done two to three months pre-establishment to determine what fertilisers may be required.

With a vast array of forage crops available to UK farmers, our team has prepared a separate guide in this series. To request a copy of our forage crop guide visit our website.



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