The Grassland Management Guide Grow Your Future With Grass

BARENBRUG

About Us - 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, sports & leisure and residential markets.

Part of the Royal Barenbrug Group, the company was founded in the Netherlands in 1904 and operates in 20 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, protein production 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 trial sites throughout the UK. The company has ISO9001 certification plus Soil Association accreditation for its organic varieties.

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The Story Of Grass

The breeding and commercialisation of a new grass cultivar is a long and challenging business.



The Value Of Grassland

Good quality grazed grassland is the cheapest feed for ruminant livestock and is the base upon which profitable farming is built. Over 66% of utilisable agricultural land in the UK is grassland with nearly 60% in permanent pasture.

Grass is becoming increasingly important in all areas of agriculture, not only for livestock but as a break crop in arable rotations to interrupt pest cycles, improve soil health and promote biodiversity. It can also be used as an energy crop for anaerobic digesters, an essential part of diversification projects and to provide another income stream.

The UK has an ideal climate for growing grass. Ryegrass grows best at between 5°C and 25°C – and most of the UK is between these temperatures 95% of the time. Like all other crops, growing grass requires careful management to maximise yields and utilisation.

Armed with information about how grass grows and different species and management techniques, farmers can make informed choices about what kind of grass to grow; when to sow it; how long to graze it for; and what to do to ensure its performance long-term. Treat your grassland like a perennial crop.

Grass under ideal conditions can yield up to 15 T DM/ha/ year.

The Benefits Of Grass

Two driving factors in every farming enterprise include:

- Production costs
- Animal and plant performance

By aiming to reduce production costs and improve animal and plant performance we can optimise productivity and profitability.

One way of doing this is to grow as much high quality forage as possible – reducing reliance on bought-in feed. Grazed grass is the cheapest feed available on most British farms.

Whether grazed or fed as conserved feed, as hay or silage, grass can make up a large proportion of the high quality diet for cattle and sheep.

The Potential Of Grass

The UK has over 7 million hectares of managed grassland – yet much of it is poorly utilised. To grow top quality forage efficiently, it is important that leys are in good condition and not overrun with weed grasses that have little nutritional value.

The best way to get the most from grass is to maintain wellmanaged swards containing species selected to suit your needs – either by regularly reseeding or overseeding.

Making a relatively small investment in grass establishment and management can have a major impact on its quality, productivity and utilisation.







Return On Seeding Investment

Reasons To Reseed

Reseeding can feel like a major investment, but improvement in quantity and quality of grass production is definitely worthwhile.

On average, dependent on methods, reseeding costs around £920 per hectare. After a reseed, new grass, in a two-cut system, has the potential to provide an ME of 187,420 MJ/ha.

This energy is capable of producing more than 35,362 litres of milk or 3987 kg of lamb or beef.

Using 10-year average milk and meat prices that equates to:

- Over £10,000 worth of milk
- Over £14,000 worth of beef
- Over £17,000 worth of lamb

High quality grass is more palatable to grazing animals. New swards are more digestible and have a higher protein content.

Figures are based on:

- The 10-year rolling average price for milk of 28.51p (AHDB, 2012 2021)
- The average UK beef price of 351.55ppk (AHDB, 2012 2021)
- The average UK lamb price of 437.65ppk (AHDB, 2012 2021)

Actual Costs

Here's an overview of typical costs associated with reseeding and overseeding.

Cost Of Reseeding (per ha)*

Soil sample		£25.00
Lime	2.5t/ha	£95.00
Spraying material	5l /ha Glyphosate	£52.50
Spraying costs	X2	£33.00
Ploughing		£75.00
Rotovating	X2	£88.00
Rolling	X4 (Cambridge)	£104.00
Fertiliser	250kg/ha 8.20.30	£189.00
Fertiliser application		£15.00
Grass drilling		£48.00
Grass seed	With a harrow; using a	\pm 160.00 (only ~ 20% of total cost)
Post emergence spray	perennial ryegrass and white clover mixture	£35.00
Total cost		£919.50

Cost Of Overseeding (per ha)*

£75.00
£34.00
£34.00
£95.00
£25.00

*These prices are based on The National Association of Agricultural Contractors 2022/2023 rates.

The Cost Of Doing Nothing

As fields age, the return from that field can diminish. This is primarily from an increase in weed or low-value species in the sward. As the proportion of weed species increases, the quantity and quality of dry matter biomass produced decreases.

The graph below shows that just one year after reseeding, weed species can make up to 18% of a sward. After 4 years, that figure has more than doubled to 38% and, after 8 years, weeds will be starting to dominate the sward (51%).

On average, an ageing field will typically yield lower than a new field. If an old field is yielding 6 tonnes of DM/ha rather than 10 tonnes, at a value of £140/tonne of dry matter, that's £560 per ha of lost potential.









Years after reseeding



Perennial ryegrass and weed grass response to nitrogen and £ Value of N wasted



% N response | £ N Wasted

Older fields will also prove problematic when it comes to the use of fertiliser - wasting around £343's worth per year. This is due to a less efficient response to nitrogen from non-ryegrass species.

Figures are based on:

- Ammonium nitrate at £650/tonne, with an assumed application rate of 300kg/ha.

Grassland Management Guide

4 Steps To Success

If you want to turn your grass into gold, take into consideration these 4 things:

1. Understand

- Learn about species and management
- Use our Field Indexing guide

2. Think Soils



• Get soil structure and soil fertility right to optimise grass growth and quality

1 Jest

3. Plan

- Consider farm production goals, and how grass crop species can help to achieve them
- Prioritise which fields to reseed

4. Establish & Develop



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- Reseeding
- Overseeding
- Establish and manage through the first year

1. Understand



Sown Species Guide

There are over 10,000 species of grass in the world. Ryegrass is the best option for high quantity and quality production of forage in the UK, and some other useful species are listed here as well.

Perennial ryegrass remains the most popular grass for pastoral agriculture in the UK. But there are many other species that the farming sector relies on including clover, herbs, brassicas, and other grasses. Other species can be used to fill gaps in the farm fodder flow, reduce fertiliser inputs, improve soil structure, provide biodiversity, and thrive in conditions where ryegrasses struggle.

All ryegrasses are capable of producing high yields of high quality grass for cattle grazing. They can be used for both cutting and grazing. Ryegrass varieties are either diploid (two sets of chromosomes) or tetraploid (four sets of chromosomes) forms. In general, tetraploid varieties are larger plants with wider leaves and higher water-soluble carbohydrate content, meaning improved digestibility, intake, utilisation and animal performance. A lower tiller density makes tetraploids more clover friendly in a mixture. Diploids have a higher tiller density making them more robust to hoof traffic and weather conditions, as well as more competitive with weeds. Used together in a mixture, diploids and tetraploids provide the best of both worlds.

PERENNIAL RYEGRASS - Lolium perenne



Description

The most commonly sown type of ryegrass. For use in pastures that will be in for 5+ years. Dark green and glossy, tufted growth habit. Folded shoot and leaves. Flowering Head: Flattened spike with the spikelets arranged alternately on opposite sides of the stem. The spikelets are stalk-less with the narrow, rounded face fitting against the stem. Leaf Blade: Ribbed on upper surface, smooth and shiny underside.

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Red at base of stem. Auricles & Ligule: Auricles are usually well developed, up to 1/12 of an inch (2mm) long, or are sometimes lacking.

ITALIAN RYEGRASS - Lolium multiflorum



Description

Italian ryegrasses are generally used for 2 years, making them very useful in shorter rotations. Italians produce more dry matter than perennials, but have lower tiller density, so are well suited to cutting or intensive grazing situations. A brighter green than perennials, densely or loosely tufted. Similar to perennials but leaves are rolled and not folded. Tends to be larger and more densely tufted than ryegrass. Leaf Blade: Ribbed on upper surface, smooth below.

Red at base. Auricles & Ligule: Narrow, spreading, prominent when old. Small, 2mm. Blunt.

HYBRID RYEGRASS - Lolium x boucheanum



Description

A cross of perennial and Italian ryegrasses, hybrid ryegrass generally persists for 3-5 years, depending on parentage. Hybrids can extend the grazing season with increased production in the spring and autumn shoulders, and also generally produce more biomass than perennials.

WESTERWOLD - Lolium mul. westerwoldicum

Description



Westerwolds are an annual ryegrass that have a 12 month +/lifespan, and produce lots of biomass within their time. They have rapid germination and emergence, making them useful for sowing immediately after another crop, and rapid growth when biomass is required in short order.

An annual ryegrass. Recent breeding advances in the development of quality Westerwold varieties mean it is now a serious option for UK farmers. Westerwold annual ryegrass

is an ecotype of Italian ryegrass selected for earliness and is not botanically different from Italian ryegrass and its characteristics are also similar.

TIMOTHY - Phleum pratense



Description

Modern timothys are bred to have softer leaves and higher palatability than older varieties. Generally light green or greyish-green. Flattened shoot. Flowering Head: Dense cylindrical spike. Spikelets are small, single flowered and tightly packed; green, often tinted pink or white. Leaf Blade: Flattended Broad leaves. Smooth, double rib down the centre. Boat shaped at tip. Auricles & Ligule: Small and spreading, minutely hairy. Short, 2mm. Finely serrated.

COCKSFOOT - Dactylis glomerata



Description

Modern cocksfoot varieties are finer leaved and have a more spreading growth habit that older varieties. Often bluishgreen in colour, leaves emerge from the basal growing point folded flat. One-sided, distinctive flower/feather-like seed head. Spikelets are small flattened and condensed into oval shaped clusters. Auricles & Ligule: Dull leaf, flattened, wide and flat.

TALL FESCUE - Festuca arundinacea



Description

Tall, tufted perennial. Short bristles along edge of collar. Leaf Blade: Broad green leaves, fringed auricle and strongly ribbed leaves, glossy lower surface. Auricles & Ligule: Small and spreading, minutely hairy. Short, 2mm. Finely serrated.

CHICORY - Chicorium intybus



Description

A herb with salad-like leaves, and blue flowers. Has very good nutritional quality, and can be used to finish fattening animals. Often used in a mix with grass to augment pasture quality and provide biodiversity. Has a very deep taproot which can help to improve soil structure and drainage, and access water and nutrients below the grass root zone. Has anthelmintic properties.

PLANTAIN - Plantago lanceolata



Description

A perennial herb with a deep tap root, making it tolerant to dry conditions. The taproot can improve soil structure and drainage, and brings up minerals from below the root zone that augment a ruminant diet. Plantain has high digestibility and palatability. Also known as ribwort plantain.

WHITE & RED CLOVER



Description

Clovers fix nitrogen in the soil and are a valuable contributor to high quality pastures. The amount of N fixed depends on several factors including clover species, soil temperature, amount of artificial nitrogen present, and rainfall. Adding clover to grassland can increase sward digestibility and protein levels.

White Clover - Trifolium repens

A perennial legume with round trifoliate leaves. Spreads vegetatively using stolons - above-ground branches that provide sites for new leaves, roots, and flowers. White clovers have a low growing point making them very well suited to grazing.

Red Clover - Trifolium pratense

A perennial legume that typically lasts for two to four years. Oval leaves, an upright growth habit, and a strong deep tap root. Red clovers are larger and taller than white clover, and are excellent at attracting pollinators. Their growing point is higher up the plant and they are less tolerant of close or constant grazing, making red clovers more suited to cutting systems. With proper management, red clover can persist for 5+ years. In older varieties, high levels of phytoestrogens should be avoided in pregnant animals.



Quality In Every Bag

In addition to breeding high performing varieties and designing products that provide solutions for on-farm production goals, selling high quality seed relies on sound production principles. Barenbrug UK has an excellent seed production team and group of seed growers, dedicated to making sure that everything we sell is up to standard.

For more information on varieties, consult the Recommended Grass and Clover List. Varieties included on Recommended Lists have been have been tried and trialled in robust small-plot trials and subjected to rigourous scientific review. Ryegrasses germinate around soil temperature 10°C, and established swards restart spring growth around soil temperature 5°C.

All seed crops are inspected by trained and registered seed inspectors, who examine crops to make sure they are the correct variety, and conform to the standards of that variety, as well as crop cleanliness.

After harvest, all crops are tested for purity and germination. Purity is a count of the amount of weed seeds, inert and other matter in the seed sample, and germination is the percentage of seeds that germinate in standard conditions over a set amount of time. Both factors must achieve a minimum to be sold in the UK, and we strive to far exceed both of those standards.

When the seed production process has been followed to the letter, certified seed is the result, which means we can guarantee the quality of every bag of seed that we sell. We can trace the origin of that seed right back through our entire production process to the basic seed sown in the ground, and know what has happened every step of the way.

Cheap seed makes expensive feed – buying certified seed is the best way to guarantee the successful establishment of a field, and its long term success as a result.

Forage seeds are generally small; ryegrass seeds range between 221,000 seeds/kg for tetraploid Italians, to 600,000 seeds/kg for diploid perennial ryegrass. Clovers and brassicas are smaller again, with 1.5 million seeds/kg for white clover. There is a lot of potential feed in one kg of seed. For more information on brassica crops, please consult our Brassica & Forage Crops Guide.

Plant Physiology

A ryegrass field is made up of a population of ryegrass plants, each of which is comprised of tillers. A tiller is comprised of a basal stem, a leaf sheath and up to 3 growing leaves.

A tiller will only support 3 live leaves. As a fourth new leaf is produced, the oldest leaf starts to die. When a fifth leaf is produced, the second leaf dies and so on.

What appears to be one ryegrass plant is an amalgamation of mother and daughter tillers, sharing the same rooting space. 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 3 leaves will vary, depending on growing conditions.



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.



Typically, fields grow in 3 phases, working in line with tiller production and energy reserves:

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

During the lag phase the tiller is using energy reserves stored in the bottom 5cm of the above-ground plant to furnish the growth of its first leaf. In the linear phase the second and third leaves develop, at an increased rate because photosynthesis can be used to power further leaf development. In the ceiling phase the fourth leaf develops, and the first leaf starts to die off, meaning that there is little gain in biomass, and the beginnings of reduction in stand quality. Additionally, the accumulation of dying older leaves can create an ideal environment for fungal disease proliferation.

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 quality are achieved. This means not grazing or cutting too low, leaving the plant sufficient energy reserves to grow the first leaf, as well as resting plants long enough to replenish energy reserves ahead of the next defoliation. It also means cutting or grazing relatively frequently before bottom leaf senescence.



7 Habits For Effective **Grassland Management**

Control weeds

• Limit soil damage (compaction or poaching) wherever possible

- Make a fertiliser plan soil test and take a long-term view
- Set up fields to promote even and consistent grazing; this can include altering field size based on the number of animals, and the position of water trough and gates, but also minding the size of flock or herd and how long they are in a field
- Graze to an appropriate residual, leaving at least 5cm of plant behind so that the first leaf can regrow efficiently
- Rest the field long enough so that the ryegrass plants have a chance to replenish their reserves; ideal time to return is at the 2.5 - 3 leaf stage, also coinciding with when pasture quality and quantity is optimised
- Consider mowing to even up a field and maintain the grazing height, particularly during reheading season or if patches are consistently ungrazed

Fertiliser

Current soil tests are the best way to measure and manage the nutrient and pH profile of your soil. Ryegrass swards are responsive to nutrient additions, particularly in light and frequent applications.

Aim to maintain a soil pH of 6 or above, and soil nutrients at the appropriate levels for soil type. Feed soil including nutrients removed as crop or grazing offtake.

The AHDB's (Agricultural and Horticultural Development Board) Nutrient Management Guide (RB209) gives information for all cutting and grazing regimes for fertilisers as well as values for slurry and farmyard manure. Monitor areas that are prone to compaction, like gateways and around troughs, to ensure soils are not being damaged. Also, wherever possible, strive for optimal grazing management so that grass plants and populations are kept in good condition. For more information on grazing management, please see page 33.

SWARD STICK Cattle

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, our 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. Walk all relevant fields once a week to monitor sward height. Following a similar route each time, take 30 to 40 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.

You can order FREE sward sticks from our website www.barenbrug.co.uk



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Soil Structure & Nutrition

Looking after soil structure and nutrition are the two key fundamentals of any good grassland management scheme. Soil structure impacts erosion, nutrient and water retention, crop health and treading resistance. It is important to take time to assess soil structure and health to ensure it can support a productive grass ley. Well-structured soil allows for a good drainage, and has roots and worm channels throughout the soil profile.

Good soil structure has many benefits. It allows the roots of crops to penetrate deeper into the soil profile, improving drought tolerance and enabling crops to reach more available nutrition. Good structure will also allow better infiltration of water, reducing the risk of erosion from runoff. This means that any nutrition applied to the crop is better utilised and poses less risk to the environment.

A well-structured soil will also better retain the water that infiltrates it, reducing drought pressures. The improved drainage and water holding capacity will also help to reduce poaching and ruts from livestock and machinery.

Assessing Soil Structure

When assessing soil structure there are a few factors to consider. Soil must have moisture but not be too wet or dry, as this can make it difficult to see the structure. It is also important to pick representative areas of the field; ideally choose areas where crops are performing poorly (yellowing, stunted growth, high weed populations, poor drainage etc.) as well as areas where crops are performing well.









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This will allow for comparison and to assess if structure is an issue. If there are varied soil types though a single field, then these should also be assessed separately. Areas around gateways and feeders should be avoided as these will not be representative of the field as a whole.

Dig as many soil profile pits as necessary to assess the condition of the soil. Mark out a square 50x50cm then dig to a depth of at least 30 – 40cm. Is the structure granular and blocky and easy to break apart? Or platey and difficult to split? Also look out for evidence of worm channels, root penetration and water infiltration across the whole profile. A lack of these can be a sign of poorly structured soils and compaction.

Assessing Soil Nutrition

Assessment of nutrition should be conducted though soil sampling. Samples should be taken every 3-5 years and/or prior to reseeding and sent to the same laboratory to maintain consistancy in results. Between 25-30 soil cores should be taken to 7.5cm depth in a "W" pattern across the field, avoiding gateways, feeders, water troughs etc. Sampling should be done when soils are moist. If the soil is too wet or dry it can be difficult to obtain a representative sample.

When assessing soil fertility, soil pH is as important as the quantity of nutrients present. Soil pH effects nutrient availability to the plant. A target of pH 6-6.5 is optimum for healthy grassland. A decline to pH 5.5 can reduce grass yields by 35-40%.

Requirements can be met with manures, which also help to improve soil structure and reduce costs from bought in fertiliser; remember to consider trace elements. Some bedrocks are deficient in particular elements, meaning that they will not be present for grass growth and will also be lacking in the pasture component of animal diets.

Manures are an important source of nutrition and organic matter to the soil. Nutrient content can vary by system, application timing and ground conditions. It can be useful to send off samples of manures for analysis, allowing for more accurate nutrient management planning. For more information please consult the AHDB's Nutrient Management Guide Section 2 – Organic Manures.





Making Plans To Improve The Grass Platform

Planning to reseed 15% of your grassland every year will ensure complete platform renovation every 6 years.

Grass genetics have changed a lot in the last 20 years - with grasses showing an average year-on-year improvement in yield of 0.5%. The same as livestock genetics - don't use what's 30 years old when better is available.

When choosing a grass seed mixture think about goals for the crop:

- How long will it last?
- Spring or autumn sowing?
- Will it be cut or grazed? Or both?
- How will your field be grazed or cut, including what class of livestock will be using the grass?
- Do you need strong ryegrass growth rates early in spring or is late spring feed quality more important? Is autumn growth important?
- Do frost/drought/waterlogging/extreme soil conditions etc, need to be taken into account?
- How much feed is required in total for the year, to achieve all animal production goals?
- What time of year is the feed required?
- Will there be periods when fodder flow is interrupted, and how can these gaps be covered?

Choose mixtures that include grass species and varieties that are suited to the farm production goals.

The next step is to create a grassland management plan and decide the best time to take a field out of rotation to sow. Grass seed can be sown at any time from April to September - ideally when the soil is warm and moist or when rain is forecast and the weather is frost free. In order to determine a priority list for reseeding fields, check out the Field Index Guide on page 35. This will give each field a rating of 1-5, with fields at the bottom of the scale requiring attention more urgently than fields at the top of the scale.

Grassland Management Guide

Overseeding

A Short To Medium Fix

Overseeding is a short- to medium-term option that can provide a quick fix and is an effective method of improving pasture productivity with lower costs than a full reseed. Overseeding is ideal for not taking a field out of rotation, but needing to ameliorate the quality of some fields and the productivity of the overall platform.

While new swards typically outperform older ones, overseeding can help to increase dry matter yields short-term – reducing reliance on purchased feed. Implemented carefully, overseeding has the potential to improve pasture productivity between 30%-40% for 3-4 years, depending on field quality and species used.

When overseeding, it is crucial to use a mixture designed specifically for this purpose. Existing grasses in the ley already have an established root system to access nutrients, moisture and an established leaf canopy to capture light for photosynthesis. Any grass seed that is introduced needs to be able to compete in these conditions and overseeding mixtures are formulated accordingly. White clover can also fill in gaps to reduce weed ingression and improve pasture quality





Reseeding

For Fields Beyond Repair

Reseeding is an investment. Taking the time to reseed properly will set up a field for a long and productive contribution to the farm. Careful consideration of all the steps for reseeding will be well worth the time taken (see page 31).

An important consideration for reseeding is the product being sown, taking into consideration the production goals and other questions for the field that were considered in step 3. Careful selection of species, variety, and mixtures will be very important so that all goals can be met practically. Information on grass, clover, and herb species can be found on pages 14-17, and for up to date information on mixture products, please consult the Barenbrug UK website at www.barenbrug.co.uk.

Overseeding Steps

Step 1

Dig a soil assessment pit to look for compaction and plant rooting structure, which should go 30cm deep in a perennial ryegrass/timothy sward. Address compaction with aerators or sub-soilers as needed.

Step 2

Soil test to asses pH and nutrient levels in the top 4" of the soil. This is particularly important in high rainfall areas where nutrients can leach out with water. Check what plant species are present, both sown and weeds.

If grass weeds make up more than 30% of the sward, harrow hard to remove them as they are usually shallow rooted and pull out easily. With a sward of more than 70% weed grasses Sow when the soil conditions are neither the best option is to reseed the sward.

Step 3

Minimise competition to new seedlings by grazing tightly with sheep or taking a silage cut. DO NOT fertilise before overseeding, as this will favour existing plants and increase competition to the new seedlings.

Step 4

Control perennial weeds before seeding by spraying with a selective herbicide on advice from a BASIS gualified agronomist. Observe chemical withdrawal periods for adding grass and clover.

Step 5

Use a spring tine harrow to remove any dead stalks, thatch and shallow rooted weed grasses. Make sure that the tines are working the top 1cm of the soil as this will create the seed bed for the new seeds.

Step 6

Choose a grass seed mixture designed for the job.

excessively dry nor wet and use a specialist mixture designed to establish rapidly

Step 7

Roll the sward to ensure good seed contact with the soil and to conserve moisture.

Step 8

Graze lightly, do not pull out of the ground. This will encourage tillering and allow light into the sward. Continue at frequent intervals until the plants are well established. See page 33 for information on the first graze.

Reseeding Steps

Step 1

Dig a soil assessment pit to look for compaction and plant rooting structure, which should go 30cm deep in a perennial ryegrass/timothy sward. Address compaction with aerators or sub-soilers as needed.

Step 2

Soil test to asses pH and nutrient levels in the top 4" of the soil. This is particularly important in high rainfall areas where nutrients can leach out with water. Take necessary steps to rectify any and all issues as well as practically possible. Check which species are present, particularly weeds, as this will inform a plan for weed control before and/or after tillage and early in the life of a new pasture.

Step 3

Seed bed preparation. This will depend on the farm's approach to tillage, and can include a full plough followed by cultivation, a chemical termination of the existing sward with glyphosate, direct drilling, or a light till with a rotovator. These decisions will depend on philosophical approach to tillage, weed species present, farm rotation, and other environmental and management goals. Regardless of the approach, the goal of seed bed preparation is to plant into a fine, firm and clean seed bed to give the seed the best change of establishment.

Step 4

Drill. Regardless of the type of machinery being used, it is important to plant forage seeds at an appropriate ground speed, so that the relatively small seeds are placed at a consistent and appropriate depth. Seeds placed too deep can take extra time to emerge or may not emerge at all, resulting in a patchy sward which allows ingression of weeds.

Step 5

Ensure good seed to soil contact by rolling. Seeds absorb moisture from the soil to begin the germination process, so good contact with soil means the process starts promptly, and germination is faster and more uniform.

Step 6

Weed control by all means possible will always benefit the quality of the new sward. The best defence against weeds is a strong grass stand, so protecting the young forage plants while the sward fills in will pay dividends over the life of the field. Grass and clover seedlings are not particularly competitive and can be overwhelmed by high weed populations, making the stand patchy and thin later on.

Developing Your Grassland

The First 12 Months Are Critical

Newly sown leys should be considered as 'establishing' for the first 12 months. Many new leys can achieve high DM yields in the first year, even though their rooting structures are still developing - but management during the first year is critical to achieve long-term persistency and performance as a stronger root system is better.

- Treat your grass like a crop, as it has a high value
- New grassland responds well to light applications of fertiliser
- Be mindful of weeds, and control early
- Wherever possible, use grazing best management practices, and avoid damaging the new ley. Measure and monitor

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 (bottom picture), the pluck test is passed. If the entire plant's roots pull out of the ground (top picture), it is too early to graze.





First Grazing Of A New Sward

The role of first grazing is to allow light to the base of the sward to stimulate tillering and enable clover to flourish.

Remember:

- First grazing is not about feeding animals, its about removing the tips of the plant to encourage new growth and ensuring clover has access to light and an opportunity to establish
- Don't graze too soon. Understand how the 'Pluck Test' (bottom left) can help timing. This may be 6 – 8 weeks under good conditions for perennial species
- Always use the lightest stock class available and leave a 4-5cm stubble to allow the plants to recover quickly
- In spring, don't let the cover build up too much as this can reduce quality and limit tillering

When To Graze

Grazing Too Early

Grazing grass too early – before a second leaf appears on a tiller – can damage grass persistency. If a plant's reserves have not been fully restored, it will require more time for the plant to regrow and recover. Repetitive early grazing can permanently decrease grassland yield, persistence and resilience. Grazing at the right time is especially important through dry summer periods when plants are under dry stress; grazing the first new growth after a period of dryness and before a tiller has 2 and a half new leaves in place can seriously harm the sward.

Grazing Too Late

If grass is left to grow too long (>3500 kg DM ha or more than 3 leaves per tiller), bottom leaves will start to die off, and there will be little additional contribution to biomass. If the sward isn't grazed or cut this can cause a build-up of dead material at the base of sward leading to:

- Reduced quality and reduced meat or milk yield
- Increased risk of disease, as rust and other fungi can build up on dying leaves
- Reduced clover content due to shading
- Decreased grazing intake and utilisation, leading to a lumpy field without uniform grazing height

First Cutting

- When cutting leys, do not cut too low, this will depend on the species present. This is to allow speedy regrowth from live, green basal leaves which can photosynthesise
- Cutting too low means the plant has to use energy from its reserves to regrow. It can also significantly reduce persistance of certain species such as red clover
- Try and avoid making heaving cuts of silage, haylage or hay within the first 12 months as this reduces tillering and persistency







Weed Control

Weeds compete with the grass ley, nutrients and moisture. Many weeds will thrive in newly sown leys where competition is lower.

Tackling weeds is essential as they can:

- Lead to grazing rejection of weeds as well as the grass around them; this means wasted feed but also increasingly patchy and lumpy fields
- Reduce the palatability of the sward
- Decrease the digestibility of the sward
- Be injurious when ingested
- Be poisonous e.g. Ragwort
- Set seed, contributing to the growing weed population and soil seed bank
- Host diseases and pests

Weed control can take many forms, and is best approached with a combination of methods and timings. Depending on the weed species present, consider mechanical removal such as mowing or grazing, and chemical options where appropriate.

Understand Your Grass Field Indexing

The same way that livestock can be body condition scored, so too can pastures.

With 5 being a sward that is a primarily sown species and highly productive, and 1 being a field that is weedy and has low biomass production, and which should be ameliorated urgently, these pages will demonstrate how to apply our field indexing system to monitor your pastures, so you can optimise your reseeding program, and make profit from good grass.

The first step is to complete a visual assessment of your fields. Cues such as grass colour, sward density, weed content, patchiness, and preferential grazing of some areas are all factors to take into consideration.

5 INDEXES

INDEX





This field is classed as an INDEX 1.

How To Score

Walk the field and assess grass and weed content.

An INDEX 1 field will have less than 25% sown species remaining and unlikely to be very productive.

The gaps created by the disappearing ryegrass have created space for weeds and low-value grasses like annual meadowgrass, yorkshire fog and bent grasses.

Weed grasses deliver less biomass than ryegrass.

An INDEX 1 field is not traffic tolerant, as lower ground cover makes the field more susceptible to poaching and damage to soil structure. In addition, an open sward means that the water cycle is compromised, from decreased plant uptake and increased run-off.

What This Means

A field with INDEX 1 is not yielding much quantity or quality of biomass and is more prone to soil damage. It is important to try to ameliorate these fields to improve the overall grass platform on the farm.



What To Do

A fertiliser application is not likely to help the situation very much, as the weeds will benefit from the nutrients as well, and there will be nutrient loss in bare patches. In this situation, a reseed is recommended.

It is important to identify any factors that might be causing the grass stand to become poor, beyond the field being old or having been managed poorly in the past. Look for issues with drainage, soil compaction, slope and aspect, and conduct a soil test to identify any chemical deficiencies. While some issues cannot be addressed quickly, it is better to be aware of them and begin to manage accordingly.

- Less than 25% sown species and a high weed content
- Extremely open sward increasing risk of erosion and nutrient run-off and allowing weeds and weed grasses to dominate
- Applying fertiliser will not rectify the situation
- The cost of replacing lost forage with concentrate or bought in forage will be high
- Only course of action is to do a full reseed including correcting any soil fertility or compaction issue



2

There is evidence throughout this field that it has been considerably damaged by overwintering of stock - making it an INDEX 2.

How To Score

Walk the field and assess grass and weed content.

An INDEX 2 field will have less than 50% sown species with less than 10% clover (if sown), coupled with more than 40% weed content or gaps.

The sward will be very open.

There will be some ryegrass and sown species left in the field, but it is of poor quality.

This could be because of a number of factors including poor weather, nutrient deficiency, soil compaction or poaching in the existing sward.

What This Means

An INDEX 2 field is low yielding, low in feed value and has limited ability to cope with wear (grazing) or stress such as drought. The open areas of the field will not protect soil, hold nutrients or promote biodiversity.



What To Do

There are still a couple of options available to fix an INDEX 2 field.

- 1. Reseed
- **2.** Overseed to ameliorate to an INDEX 3 or 4, and give the field a few extra years of life before requiring a reseed.

It is essential to address soil fertility compaction as part of the remedial process. When considering overseeding, select species and varieties with the vigour to compete in an overseeding situation.

- Less than 50% sown species with less than 10% white clover (if sown)
- More than 40% weed content
- Sward very open with soil visible meaning risk of erosion and nutrient run-off is high
- pH and nutrient levels low. Compaction likely
- The cost of replacing lost forage with concentrate or bought in forage will be high





3



While still productive, due to age and conditions this field has some open spaces that are allowing for weed incursion. This field is classed as an INDEX 3.

How To Score

Walk the field and assess grass and weed content. An INDEX 3 field will have a total of 50-60% sown species (including clover at less than 15%, if sown). It will also have up to 40% weeds and/or gaps.

A common example of weed incursion is docks covering around 20-25% of the field, and at this level weeds can cost up to a quarter of ryegrass yield.

These fields can be difficult to score as they are not too bad but have some issues starting, which need to be addressed through management. Do not be afraid of scoring a field incorrectly, as any action will still help to ameliorate the grass platform.

What This Means

At INDEX 3, management can be used to correct the problem and extend the life of the sward.

INDEX 3 fields are providing reasonable quantity and quality of forage, have sufficient ground cover, nutrient efficiency and biodiversity but still have clear room for improvement on specific issues to optimise productivity and environmental benefit.

The goal is to achieve as dense a grass sward as possible to eliminate any invasion of unproductive species.

What To Do

Determine what is causing the field to lose condition in order to decide what changes need to be made. This can include changes to grazing management, but also soil sampling or fixing areas of compaction.

If broad leaved weed burdens are significant, spring is an ideal time to control them chemically, as this is when the plants are actively growing. Take advice on herbicides from a BASIS qualified agronomist. Once weeds have been removed, if there are open spaces, overseed with a quality grass seed and encroach before weeds get a chance to thrive in the bare earth. This is also an ideal time to add clover which will boost the quality of the sward.



- 50-60% sown species with less than 15% white clover (if sown)
- Open spaces allowing weeds and weed grasses to appear
- pH and nutrient levels may be sub-optimal do soil samples
- Soil compaction may be occurring check soil structure particularly in gateways and around water troughs
- Oversow with grass and clover (where applicable) to extend the life of the sward and prevent further decline
- The cost of replacing lost forage with concentrate or bought in forage will be low to moderate





Δ



Some parts of this field are starting to show signs of low-level damage. Grass growth is less vigorous and there are some weeds visible; however, there are still plenty of healthy target plants in the sward and it can be classed as an INDEX 4 field.

How To Score

Walk the field and assess grass and weed content. An INDEX 4 field will have a total of 60-80% sown species, and clover making up 30-40% of the plant population, if sown.

If these levels of productive species content are achieved, the clover has the potential to add 150kg N/ha/yr, a high protein content, which helps ensure high animal performance and reduced reliance on nitrogen fertiliser. In these swards nutritional quality will generally not constrain animal performance. The energy content of good, well managed ryegrass and clover swards is consistent at above 11.5 MJ/ kg DM.

What This Means

This field is not a problem, but it will have to be monitored, and planned improvements (e.g weed control or overseeding) will be needed if the productive species drops towards 60%. This field provides good yields of quality forage, has good ground cover meaning soil is protected, and the high proportion of sown species means the plants are cycling efficiently and utilising any fertiliser applied. A range of sown species promotes biodiversity. The goal is to achieve as dense a sward as possible to eliminate any further invasion of unproductive species.

What To Do

To maintain an INDEX 4 field, check soil fertility regularly and apply a light application of summer nitrogen to encourage tillering. Maintaining a soil pH above 6 will help promote clover and rhizobia activity as well as promote general soil health. Regularly monitor this field to keep it from declining to INDEX 3.



Key Points

- Good proportion of desirable healthy plants; 60-80% sown species and clover content 30-40% if sown
- Some weed ingression, less than 10%, not a significant burden
- Mild signs of wear and tear
- Immediate action to improve this field is not required
- Plan field maintenance to prevent the field condition diminishing to an INDEX 3
- Animals will perform well on these fields. The cost of replacing lost forage with concentrate or bought in forage will be low to none

42



5



Vigourous growth from a dense and healthy sward free from weeds means this field is an INDEX 5.

How To Score

Walk the field and assess and weed grass content.

An INDEX 5 field will have over 80% sown species with clover making up 30-40% of the plant population, if sown.

There will be minimal weed content or gaps.

What This Means

This field is high yielding and of high quality; animals will perform well on this field. It is efficient in its use of fertiliser and water because plants are well established with a good root system. It has excellent sward density to carry livestock and protect soil and, when sown with a broad range of species, will promote plant and animal diversity within the ecosystem.

What To Do

The key here is to maintain the field at this level. In order to maintain a sward like this it is important to have good soil fertility. Regular soil sampling every 3-5 years will monitor nutrient and pH levels.



- Greater than 80% sown species, with 30-40% white clover (if sown)
- Dense, leafy sward
- Conduct regular soil testing and soil structure monitoring to maintain this field
- Use the AHDB Nutrient Management Guide (RB209) to make a Nutrient Management Plan
- Animals will perform very well on these fields. There will be no requirement for concentrate or bought in forage



Field Indexing - Summary

There is no substitute for walking through a field and seeing it up close. Make time to walk through all the grass fields on the grass platform in order to monitor how they are performing, and how they are changing.

Remember

- Grass is the cheapest source of animal feed
- Walk your fields regularly using our field indexing system
- Fields that are INDEX 4 or 5 are highly productive and worth maintaining
- Fields at INDEX 3 have some problems but are salvageable with some attention and investment
- With INDEX of 1 or 2 fields it is best to start again
- Not monitoring or ameliorating fields can be a costly decision in terms of animal performance, purchased feed, and inefficient nutrient and water cycles

See the back of this booklet for a sample scorecard.

Next Steps

Watch the video guide on our website barenbrug.co.uk/farming

For additional resources, please see the Sward Stick on page 23, and check out our website and issues of BarTech for more information on pasture management

Weed Identification

Low-value Grass Species

ANNUAL MEADOWGRASS - Poa annua



Annual Meadow-grass is a low-growing grass which is a light green colour. It grows from a central base, to which all the shoots can be traced, and has a creeping rootstock.

The blade-like leaves are blunt-tipped and the yellow-green flower head is triangular with branched spikelets that contain the flowers.

TOOLS

COUCH GRASS - (Twitch Grass) - Elymus repens



A very competitive perennial grass weed. Spreads rapidly using sharp rhizomes (underground stems). It can be found growing on most soil types except those with low pH. It prefers heavy land but better able to spread in lighter soils. Germination mainly occurs during the autumn, but seedlings also emerge in spring especially when autumn germination is delayed by cold temperatures or lack of moisture. Reproduction is primarily using rhizomes, so cultivation that spreads the plant segments can worsen the problem.

CRESTED DOGSTAIL - Cynosurus cristatus



A common, tufted perennial grass weed in grassland and meadows. It tolerates many different soil types but is generally a lowland species. It grows in compacted tufts, and is stiff looking with narrow green leaves. Its dense tillering habit mean it is sometimes added to sheep pasture mixes or amenity mixtures.

SWEET VERNAL - Anthoxanthum odoratum



Sweet Vernal is a common perennial in grassland and meadows. Flowers early between April and July. Early seed set allows for improved population regeneration from seed, increasing persistence. This species contributes to the sweet smell of cut hay.

YORKSHIRE FOG - Holcus ianatus



A tufted, perennial species abundant in the UK. Seed can germinate over a wide range of soil temperatures and emerge mainly from April to October. Produces tillers that form large spreading clumps in established swards. Plants are relatively deep rooted and there is some evidence to suggest that it may have allelopathic effects on other plants in the sward. Purplish seed head, and soft hairy leaves.

Grassland Management Guide

Weed Identification

BUTTERCUPS - Ranunculus spp.



Creeping buttercup is a problem in heavily grazed, poached or wet pastures.

- Animals tend not to graze areas infested with buttercup as it has an acrid taste and affects grass yield and reduces hay value.

COMMON CHICKWEED - Stellaria media



Common Chickweed is a weed and can persist in rotational grass and establish in long-term pastures where there are gaps in swards due to poaching or slurry injection.

 With a prostrate habit and fast growth, chickweed restricts tillering of establishing grass and clover and fills in bare spaces in swards.
 Autumn sowings can be a problem as chickweed may overtake the slower establishing grasses and clovers, filling in bare patches.

- High moisture content will cause difficulties when trying to wilt for silage and also upset silage fermentation affecting the feed value.

- It will also mean a longer drying time for hay-making with loss of quality.
- Large chickweed populations may cause digestive upset in grazing lambs and calves.

DOCKS - Rumex spp.



Docks compete with grass for light, nutrients and moisture and reduce grass yields and have less than 65% of the feed value of grass.
Docks are unpalatable and, in general, animals will only eat them if there is nothing else available. Excessive quantities of docks in the diet can cause dietary upsets, especially in young animals.
Presence of docks in silage can affect fermentation, reducing overall quality.

FAT HEN - Chenopodium album



A summer annual weed that establishes quickly, particularly if soil is open. Competes with a grass sward for water and nutrients. A prolific seed producer, with seeds that can remain dormant for many years.

NETTLES - Cirsium spp.



Favouring high-fertility sites, nettles spread through tough roots forming clumps. Nettles compete with grass for light, water and nutrients and, where nettles are dense, will out-compete the sward. Grazing stock avoid mature nettles, reducing the productivity of the swards. Nettles in hay or silage may cause rejection by stock. Best controlled in the spring when they are 30-45cm tall. Frequently cutting nettles often results in more vigorous regrowth.

RAGWORT - Senecio jacobea



This weed is potentially deadly to livestock and is listed in the Injurious Weeds Act, which requires occupiers by law to control. Under the Ragwort Control Act (2003), a code of practice was developed giving guidance on identification, priorities for control, methods, environmental considerations, and health and safety issues.

They have a daisy-like yellow flower, flowering from May to October.
 Ragwort is a danger to all stock, but particularly horses, cattle,

free-range pigs and chickens. Alkaloids cause cirrhosis of the liver and there is no known antidote.

- Ragwort is largely unpalatable; ragwort may be eaten when green, particularly when other grazing is sparse. It is palatable when dead or dying because of the release of sugars, so contamination of hay or silage is very dangerous.

REDSHANK - Persicaria maculosa



A summer annual weed typically found in acidic soils. Establishes quickly and can smother out grass seedlings. Plant fragments can root at the nodes.

THISTLES - Cirsium spp.



There are 150 species of thistles worldwide, with 20 in the UK. - Thistles need controlling as they compete with grass for space, light, nutrients and water.

- Thistles are unpalatable to stock and reduce the available grazing, and can increase the incidence of Orf.

- The 2 most common and damaging are creeping thistle and spear (Scotch) thistle.

- Creeping Thistle (*Cirsium arvense*): A perennial that grows from seed or from root sections in the soil. Once established, the root mass can be greater than the plant above ground, competing with the grass.

- Spear Thistle (*Cirsium vulgare*): A biennial that grows from seed, and in the first year often goes unnoticed, since it produces only a small rosette. In the second year the plant can grow to over a metre in diameter before flowering.

Disease Identification

Insect Pest Identification

TOOLS

RYEGRASS MOSAIC VIRUS

The most important viral disease affecting ryegrass. Symptoms are more common in Italian than Perennial varieties. The virus is transmitted through a mite that thrives in dry conditions and so it is more prevalent in the East of England. Can also infect cocksfoot. Appears as light green to yellow mosaic pattern on leaves, which decreases the vigour of the plant. Severe cases can result in leaf death.

BROWN RUST - Puccinia sp.



Brown Rust occurs early in the season, during April and May and throughout England and Wales.

It only affects ryegrasses and is a different species to the brown rusts that infect wheat and barley. It can reach moderate levels in some varieties, but most have good resistance.

CROWN RUST - Puccinia coronata



Characterised by scattered orange spores over the leaves, seen in late August and September. Occurs with high rates of grass growth combined with warm days and dewy nights.

Tends to reduce yield as a result of plant stress and decrease in palatability. Spread by wind and rain splash. A problem particularly in the southwest of England and Wales.

LEAF SPOT - Drechslera sp.



A fungal infection that produces brown spots surrounded by yellowing tissue, which is encouraged by wet and cloudy weather. Cattle reject infected areas leading to excess growth and more disease build up. Spread by spores, wind and rain.

POWDERY MILDEW - Blumeria graminis



Characterised by white "sappy substance" and becomes more active during the spring and autumn periods.

Spores are produced in warm, humid conditions and damage leaf area, reducing yield and palatability. Particularly susceptible plants are the faster growing ryegrasses species such as Italians.

Spread by wind and rain splash and remain dormant through winter periods to become active early spring.

CHAFERS



The larvae of several species of chafer beetle can also cause damage to grassland in various parts of the UK. The adults are 8-10 mm long with a green head and thorax and reddish-brown wing cases.

- The grubs are white and about 18-20 mm long when fully grown.

- The feeding of the larvae produces patches of poorly grown grass that may turn very brown in dry weather.

- Damage is most likely to be seen in September–October.

- Substantial bird activity may indicate infestation, as they actively search out the grubs.

- Once infested, pastures tend to be re-infested in subsequent seasons.

FRIT FLY - Oscinella frit



This larva of the Frit fly attacks all cereal and grass crops especially those following grassy stubbles or grass. The Frit fly larvae are yellow whitish in colour and can grow to 5mm long. To help prevent Frit fly, leave a 10-week gap between the previous grass crop or grassy stubble. If grass is sown after, grass seedlings will be attacked by larvae migrating out of the old sward in addition to those hatching from eggs laid by incoming adult flies. The problem is more acute in direct drilled reseeds than reseeding after ploughing and more risky in summer and autumn reseeds.

LEATHERJACKET - Tipula spp



Leatherjackets are the larvae of craneflies, also known as daddy long legs. Theses soil living larvae cause considerable damage to roots and stems of many agricultural and horticultural crops, particularly of young plants. Legless, grey, brown, thick, tough wrinkled skin - growing to about 2 inches in length.

- On established grassland high infestations may result in large bare patches appearing in the field. With low levels of infestation spring growth may be impeded.

- Reduces yield and, at the economic threshold of 1 million leatherjackets per ha, the weight of leatherjackets feeding below ground can be greater than the weight of livestock above ground. New sowings or reseeded leys may be completely destroyed.

- The presence of large numbers of rooks, crows and starlings also indicates the presence of large populations of leatherjackets.

SLUGS - Deroceras reticulatum



The Grey Field Slug is particularly active in wet seasons especially on the heavier soil types.

It feeds on the shoots of newly germinated seeds, killing the plant entirely and may leave large areas completely devoid of plants. Damage is therefore most likely on direct reseeded leys. Other symptoms include shredding of the leaves of older plants. Slime trails would also be obvious.

UK Grass Experts | Barenbrug UK

Grassland Management Guide

SCORING INDEX

Field name: Example – Barenbrug Field Mixture / Species sown: Example – BarForage Barmix

Date:	Sept 2012	April 2015	May 2016	May 2017
Score:	3	4	5	5
P and K Index:	1 & 1	2 & 2	2 \$ 2	2 & 2
Fertiliser Applications:	Dung. 200kg. 16.16.16. 2† Ca Lime	Slurry, 2t Cə Lime, 150 25.5.5 150kg	Slurry & 150 AN. 150kg	
Fertiliser/ Grazing Regime:	Girəzed əll yeər	Giraze, 1 cvt, graze	2 cuts, graze	Giraze

NOTES/PLANNED ACTIONS

Soil sampled: 30 March
Girazing days: 1 May - 5 May, 3 June - 10 June, 25 - 30 July
Number and class of stock:
Yield from cutting:

SCORING INDEX

Field name:

Mixture / Species sown:

Date:		
Score:		
P and K Index:		
Fertiliser Applications:		
Fertiliser/ Grazing Regime:		

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NOTES/PLANNED ACTIONS

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Conditions of sale

In case of unavailability Barenbrug UK Limited reserves the right to substitute any variety in any mixture with one of similar merit.

Any change will be detailed on the bag.

The placing of an order constitutes an acceptance of our terms and conditions of sale by the buyer.

Full terms and conditions can be found at www.barenbrug.co.uk.



