



Brassica & Forage Crops Guide

Practical advice and management guide



 **BARENBRUG**



Brassica and Forage Crops

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 land¹ in the UK is given over to grass – making it one of our nations' most important crops.

While grass has to be the first priority for feeding livestock efficiently, forage crops are also important – and a valuable tool for meeting changing feed and energy requirements throughout the year.

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

With more forage options available than ever before, our guides are designed to help UK farmers make the right choices and pick products that will help them achieve their grassland goals.

This particular guide looks at the integral role that brassicas and forage crops can play in UK farming. Over the following pages we explore the benefits of forage crops and how to plan their use and manage their growth to maximise yields and profitability.

Barenbrug - Grass Experts Since 1904

Our profession is plant breeding; selecting and developing quality varieties with the essential, unique characteristics to meet the ever-increasing demands from farmers for top quality forage grass.

From its founding days in 1904 the Royal Barenbrug Group has grown into a global seed company with breeding and research stations on six continents.

Still privately owned, our knowledge and experience of grass seed is second to none.

We specialise in plant breeding, seed production and the international marketing of forage grass, forage crops and turf grasses.

With over 800 employees and operating companies in 20 countries on 6 continents, we have been the leading grass seed business in the world for over 100 years.

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Reasons to Invest in Grass

Whatever the size of enterprise, maximising home-grown feed makes sense. Providing major health benefits for animals, as well as improvements in live weight gains, home-grown feed can have a positive impact on farm finances. It can also be beneficial to the environment.

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Forage brassica crops are grown widely throughout the UK both as a supplement and as an alternative to pastures in animal production systems. Brassicas are important because they can produce high yields of high quality forage that can be fed on farm from early summer through to late winter. As well as being a feed substitute to pasture, brassicas can act as a break crop during pasture renewal. They can help with weed, pest and disease reduction and create better soil conditions and cleaner seedbeds for establishing new pastures.

Benefits of brassica & forage crops

- Strategic crop in pasture renovation – makes regressing easier i.e. fewer weed pressures
- Means of controlling spring surplus and shifting feed from spring into summer or autumn to winter
- High animal performance potential
- A number of options with a lot of flexibility
- Consistently high quality ME 10.5-13, proteins 16-24%

Husbandry

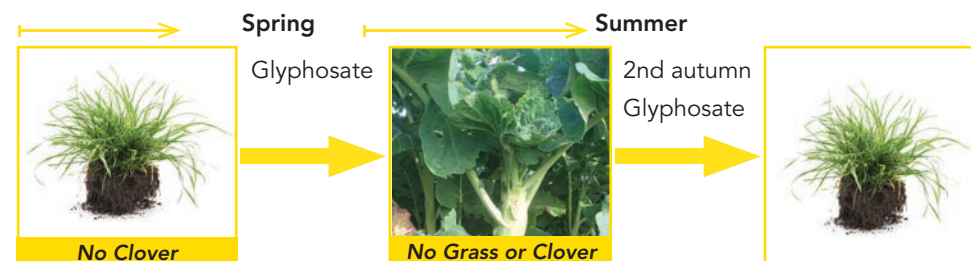
As with most things, planning is the key to success. A simple planning checklist will help you achieve your goals and can be kept simple.

We recommend:

- Identify pasture in autumn for renewing and soil test (pH problems can take six months to fix)
- Noting which fields have poor performing pastures; undesirable species; and low legume content
- Checking if fertility status has been limiting pasture production and working out how to address this to ensure a good brassica crop and a successful renovation phase?
- Planting brassicas followed by new grass in autumn (or vice versa for a winter brassica planting)

Many problems with brassica production arise from poor sowing techniques and inadequate seed bed preparation.

Once a good crop has been established, the aim should be to utilise it with minimum wastage. Find out more in the feeding guide on page 10.



The above figure is an example of an approach to new pasture establishment and can be applied from spring as a summer cropping rotation with an autumn reseed, or an autumn sprayout as a winter cropping option with a spring reseed or as a spring cropping option (kale) with a reseed in the following spring.

This approach to reseeding helps break perennial weed cycles using glyphosate and can help eliminate grass weeds such as black and meadow grasses. It is also an opportunity to break insect pest cycles leading to better grass and clover establishment and encourages forward planning and allows drainage and fertility issues to be addressed resulting in better pasture establishment.



Soil Mangement

Get soil nutrition right to optimise crop growth and quality. It isn't the animal or the bag that feeds the crop; it's the soil - so looking after soil fertility and structure are the two key fundamentals of any good grassland management scheme. Soil pH is more important than NPK (nitrogen, phosphorus and potassium) because in order for nutrients to be optimally available to the plant's roots, pH must be maintained at 6.0 or above, especially for clover swards.

P & K levels should be maintained at Index 2 (Moderate + in Scotland) and soils should be sampled every three to five years, depending on management practice and rotation. Where silage or hay is being made, remember to feed the crop as well as addressing any soil deficiencies. N should be applied when conditions allow and as appropriate depending on field use e.g., grazing or silage. N can have an acidifying effect on the soil, so higher N users may also need to lime more frequently.

Remember to consider trace element status of the farm too. Some bedrocks are deficient in particular elements, which are important to breeding sheep. If the elements are not present in the soil, they cannot be taken up by grass and so need to be supplied by other methods e.g. supplementation, fertilisers or boluses.

Routine soil sampling should be conducted every 4 – 5 years. In grassland take at least 20 samples, 10 cm deep, across a representative field area avoiding gateways and hedges etc.

- pH
- P & K
- Mg



Pre-Sowing

Preparation and Fertiliser

Typically, less productive fields are sown out into brassicas, often meaning a crop is established into soil that is in less than optimum condition. Brassicas tend to differ from other crops in certain aspects of their fertiliser requirements. Brassica yields are sensitive to nitrogen and phosphorus status. It's also important to consider trace elements such as molybdenum and boron but always base any actions on a soil test.

Phosphorus

Early purpling stunted and erect leaves are an indicator of P deficiency (this can also be induced by cool weather, so herbage testing is the best form of identification).

Sulphur (S)

Sulphur deficiency is characterised by stunted, pale or yellowed growth (particularly young growth) and leaf curling and distortion.

Boron (B)

The condition "brown heart" in bulb brassicas is the most common symptom of boron deficiency. Other brassicas may show swelling, hollowing, browning and rotting of stems.

(Next time you're shopping for broccoli, check the stem. If it's hollow, the plant was boron deficient).

Nitrogen (N)

Paleness usually indicates N deficiency. When establishing a brassica into a run out field, the crop will require starter N and a good rule of thumb is a post-establishment application at 80% canopy cover (don't worry about driving through your crop, it has time to recover). In minimum tillage situations, N is generally locked up by the soil because unlike cultivated situations, plants are broken down by microbial activity, which temporarily locks up N. This may need to be considered and compensated for at planting time.

Poor brassica fertility leads to inconsistent yields resulting in underfeeding in some situations as seen in the photo on the right.

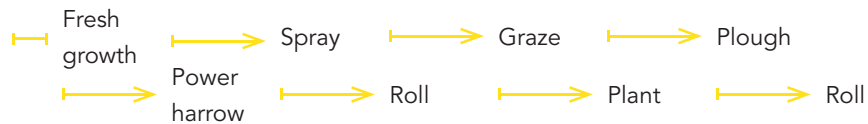




Planting

Conventional cultivation is generally the most reliable way of eliminating weeds and establishing brassicas. Make it easy for your grass establishment following the brassica crop and kill off all fresh growth with a spray, plough and bury all dead plant material, power harrow or cultivate and remember its important to roll pre and post planting.

Spray and cultivate



A full cultivation example

Spray

Each tiller requires 5-10cm of actively growing leaf for a successful kill.

Plough

After a successful kill has been achieved – bury all plant material by ploughing:

Power harrow

Aim:

- Produce the desired seedbed with minimum cost
- Brassicas, clovers, ryegrasses, etc. require a seedbed that is fine, firm, warm, moist and weed-free

Roll

This helps with:

- Even establishment
- Keeps moisture in soil

This process makes it easier for ryegrass establishment.

Sow

Sow the seed no deeper than 10mm.

A perfect seed bed is firm, friable, weed-free and consolidated.

Direct Drilling

Direct drilling is suitable if the spray control of weeds is successful and fertiliser applications are considered carefully. Use slug bait at the time of sowing and remember, slug bait will be less effective if broadcasted. Applied at drilling will have the best kill.

Seed must not be planted deeper than 10mm and always roll after sowing!

Spray and cultivate



A good plant kill is achieved prior to planting, the seed depth is considered carefully and rolling post planting is always carried out.



Which Crops to Sow?

Picking the right forage crop can feel confusing. Where do you start? Here are some key considerations to bear in mind:

- Maturity date – How long do you have to the first grazing?
- Identify feed deficit and when feed is required and select options based on the appropriate maturity date
- Do you need a single grazed option?
- Perhaps bulk feed over a short period (e.g. turnips)
- Would a multi-grazed later maturing option work (e.g. forage rape) i.e. a crop that is planted in late summer or autumn for winter feed later than turnips.
- Could a high yielding, single grazed winter crop (e.g. kale) be useful?

Getting the correct crop for the right stock class is also important and should play a big part in your decision making.



Figure 1: Sheep not utilising brassicas effectively.



Figure 2: Keeper Kale with excellent utilisation.

	Sowing rate (kg/acre)	Days to grazing	Other considerations
Spring planting			
(for summer feed)			
Barabas - Stubble Turnips	2	60	Reliable moisture
Barcoli - Forage Rape	2	90	Sporadic moisture
Spring planted			
(for winter feed)			
Keeper - Kale	2	170-220	Smaller stock, mild winters
Caledonian - Kale	2	170-220	Larger stock, harsher winters
Autumn planting			
Barabas - Stubble Turnips	1.5	60-90	Mild winters
Barcoli - Forage Rape	2	90 days	Harsher winters

SOWING & UTILISATION GUIDE	JANUARY	FEBRUARY	MAR	APR	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
STUBBLE TURNIP	USE	USE		SOW	SOW		SOW	SOW	USE	USE	USE	USE
FORAGE RAPE						SOW	SOW	SOW		USE	USE	USE
KALE	USE	USE	USE	SOW	SOW	SOW				USE	USE	USE
LUCERNE	USE	USE	SOW	SOW	USE	USE	USE	USE	USE	USE	USE	USE
VETCH	USE	USE	SOW	SOW	SOW	USE	USE	USE	SOW	SOW	USE	USE
PLANTAIN	USE	USE	SOW	SOW					SOW	SOW	USE	USE
CHICORY				SOW	SOW	SOW	SOW	SOW				



Barkant Stubble Turnip

Utilisation

Strip graze

Sowing Period

Spring or Summer

Utilisation Period

Autumn & Winter

Days to maturity

60-90 days

Stubble turnips have a high leaf to bulb ratio resulting in high levels of protein, and a tankard bulb shape to enhance utilisation.

Within the Brassicas family, turnips are the quickest species to establish. This multi-purpose forage & catch crop offers excellent autumn & winter feed potential. The very vigorous Barenbrug-bred diploid turnip, combines higher leaf production and a purple tankard root, with high sugar and dry-matter content.

Advantages

- High leaf to bulb ratio resulting in high levels of protein
- Full-leaved late tetraploid bulbing with very good early vigour
- Proven very palatable to grazing animals with good disease resistance
- Early maturing (60-90 days) for excellent summer/winter feed

Management advice

BARKANT has the potential of being grazed multiple times. The first grazing however, will be the most important one. Both sheep and cattle can graze turnips. Strip-grazing prevents both yield and quality losses due to tramping and polluting. It is also important not to overfeed the livestock when they are allowed to graze the turnips at first.

Dairy Beef Sheep

Sowing rate:

3kg-5kg/ha

Pack sizes:

Available in pack sizes of 5kg or 25kg.



Barcoli Forage Rape

Utilisation

Graze in situ

Sowing Period

Spring & Early Summer

Utilisation Period

Autumn & Winter

Days to maturity

90-110 days

A multi-purpose forage rape with excellent autumn/early winter feed potential.

BARCOLI is a flexible forage option.

It can be spring sown for a late summer feed behind turnips or autumn sown for winter grazing.

Advantages

- Good regrowth potential with excellent winter keeping properties
- Good aphid tolerance
- Fast growing leafy catch crop
- High protein content
- Longer lasting than stubble turnips
- Flexible sowing period
- Sheep, dairy or beef production.

Management advice

Plant two-thirds of the crop area in early maturing BARABAS and one-third in late maturing variety BARCOLI, at the same time (not together). This will provide a high quality summer feed that can be grazed from 60-150 days after sowing.

Dairy Beef Sheep

Sowing rate:

Drilled: 2.5kg/acre (6kg/ha).

Broadcast: 4kg/acre (10kg/ha).

Pack sizes:

Available in pack sizes of 10kg or 25kg.



Caledonian & Keeper Kale

Utilisation Graze in situ	Sowing Period Spring & Early Summer	Utilisation Period Autumn & Winter	Days to maturity 170-220 days
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Kale is a well-proven, highly adaptable fodder crop which consistently provides very high yields of succulent green fodder.

Two varieties are available. High-yielding giant type kale with potential yield of 18,000kg DM/ha.

Caledonian

A high yielding kale with good clubroot tolerance. Its huge yield makes it ideal for utilisation by dairy and beef cattle.

Keeper

A medium height kale with excellent leaf to stem ratio (greater than 50% leaf). Suitable for sheep and cattle grazing.

Advantages

- Excellent tolerance to frost
- Good aphid tolerance
- Very high dry matter yields
- Good winter hardiness

Dairy Beef Sheep

Sowing rate:

Drilled: 1–2kg/acre (2.5–5kg/ha).

Broadcast: 3kg/acre (7.5kg/ha).

Pack sizes:

Available in pack sizes of 5kg (untreated), 2kg (treated).



Bar Finisher Mixture

Utilisation Graze in situ	Sowing Period Spring & Autumn	Utilisation Period Spring, Summer & Autumn
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BAR FINISHER is a mix of chicory, white clover, red clover and plantain with excellent animal performance potential. It produces a leafy, high quality feed over spring, summer and autumn when traditional pastures can decrease in quality.

BAR FINISHER can be used as a six month or two year crop depending on the farm system and grazing management approach. The clover in the mix will provide nitrogen to feed the crop, also filling space not occupied by herbs. The red clover component, alongside the herbs, will provide high quality feed through a dry season, helping to reduce risk in summer dry areas.

Advantages

- Highly palatable, providing an excellent feed for high live weight gains
- High quality summer feed that recovers quickly after grazing

- High protein option for dairy farmers
- Clover provides fixed nitrogen
- High mineral content, particularly zinc, potassium and copper

Dairy Beef Sheep

In the bag

0.75kg	Commander	Chicory
0.75kg	Captain	Plantain
1.50kg	Prota White	White Clover Blend
2.00kg	Prota Red	Red Clover Blend

Pack size 10kg (2 acres). Sowing rate: 5kg per acre.



Brassica Feeding Guide

Tools Needed

- Length of alkathine 2.66m or slightly shorter to accommodate a joiner
- Join the ends together to form a ring, this creates an area of 0.5m²
- Empty seed bag
- Knife or other cutting instrument
- Hand-held scales
- Paper and pen/pencil
- Calculator

Take 5 to 6 Samples Per Field

Choose the sample areas from parts of the field, which are representative of the entire field and throw the alkathine ring onto the crop.

- Any stem/bulb bases that fall within the ring circumference are counted to be within the sample area (0.5m²)
- Any leaf/branches that belong to a plant with a stem base that is outside the ring are to be excluded from the material being weighed
- Remove all material by either cutting the crop down to about 1 inch from the ground e.g. for kales or pulling bulbs and leaves (ensuring dirt is removed) from swedes and turnips, put into bag and weigh

Once all the samples have been taken use the following formula:

1. Collate sample weights (kg) and take average, e.g. 5.3, 5.6, 5.4, 5.9, 5.8 Average weight = 5.6 kg
2. Multiply by 2 to get kg/m² e.g. 5.6kg x 2 = 11.2 kg/m²
3. Multiply by 10,000 to convert to kg/ha (there are 10,000m²/ha) e.g. 11.2 kg/m² x 10,000 m²/ha = 112,000 kg fresh material/ha
4. Multiply by appropriate DM% (see sensitivity table below) e.g. 112,000 kg fresh material/ha x e.g. 10%DM = 11,200 kgDM/ha

It is important to know the correct dry matter percentage as small differences in DM percentages can account for big differences in feed available as shown below.

To work out how long the feed available will last and how much feed to offer daily, farmers need to know the requirements of their animals. Below is an example in hectares to keep it simple.

A crop of turnips produces 12,000kg DM/ha and the farmer has 100 lactating cows which have a requirement of 5kg per head/day and assuming the utilisation of turnips is 80% (12,000kg DM x 0.80 = 9,600kg (down throat)).

100 cows x 5kg = 500kg of DM consumed per day 9,600kg offered / 500kg = 19.2 days

Therefore the hectare area should be split into 19 days breaks to achieve the 500kg feed needed.

kg fresh matter	11% DM	12% DM	13% DM	14% DM	15% DM
112,000	12,320	13,440	14,650	15,680	16,800

Sensitivity table



Captain Plantain

Utilisation

Graze before crop reaches 20cm. Leave 5cm residual

Sowing Period

Spring & Autumn

Utilisation Period

Summer & Winter

Days to maturity

60-90 days

Used to boost summer milk production and to finish lambs. Historically used in grassland mixtures, CAPTAIN is suited to many soil types and can increase daily intakes during the summer.

Advantages

- When fresh, feed value is greater than ryegrass/clover
- Tolerates frequent grazing
- High in protein (up to 23%)
- Can be grown alone or in mixes
- Tap rooted herb that withstands drought and higher temperatures in the summer

Limitations

- Plantain is not as drought tolerant as chicory or red clover

Dairy Beef Sheep

Sowing rate:

2kg/acre (5kg/ha) in a grassland mixture, 8-10kg/acre (19-24kg/ha) as a special purpose crop.

Pack sizes:

Available in pack sizes of 5kg



Commander Chicory

Utilisation

Graze before crop reaches 20cm. Leave 5cm residual

Sowing Period

Spring & Summer

Utilisation Period

8 weeks post-sowing

A mineral rich herb with long taproot, aiding drainage and soil structure, making an ideal cover crop

COMMANDER produces significant yields of high protein forage, especially when mixed with red clover, that lasts more than one year.

Advantages

- Improves soil health and aids drainage
- Recovers quickly after grazing
- Deep tap root, delivering drought tolerance
- Can be grown alone or with other crops
- Performs better in dry conditions
- High mineral content
- High protein content pf 17-18%
- Ideal to fatten lambs

Limitations

- Limited cool season DM production/ grazing
- Seed head control for weeds, limiting seed shed
- Needs a nitrogen source; ideally establish with clover blends
- Shallow sown at around 1cm deep

Dairy Beef Sheep

Sowing rate:

1kg/acre (2.5kg/ha) in a grassland mixture, 3kg/acre (7.5kg/ha) as a straight with clover.

Pack sizes:

Available in pack sizes of 5kg



- Saves labour
- Increases the certainty of optimal crop establishment
- Increased shelf life
- Survives difficult conditions



Utilisation	Sowing Period	Utilisation Period	Days to maturity
Grazing and silage	Spring	Year-round	40 days

A highly nutritious forage for livestock, combining good digestibility with high protein, providing excellent milk yields or daily live weight gains.

Advantages

- One of the most underrated and underutilised forage crops available to livestock farmers in the UK
- To utilise lucerne, ensure a minimum of 50% flowering (50% of the tallest stems have a flower) prior to the first grazing/cutting. If the stand is weedy at establishment it can be grazed/cut once if it is 15-20cm tall and then left to flower to a minimum of 50%
- >300 - 500 g/hd/d – rotationally grazed or cut
- High quality and high protein, easily digested
- Perennial - Well managed crops can persist for up to 5 years
- Performs well in free draining, drier environments due to tap roots

- Dual purpose cutting or grazing

Limitations

- Requires soil pH above 6.0 and high levels of P to establish
- Requires good management
- For more information and advice on management, please contact us for the guide

Dairy Beef Sheep

Sowing rate:

8-10kg/acre (20-25kg/ha). Drill at 5-12mm deep on normal soils or up to 25mm on light sandy soils.

Pack sizes:

Available in pack sizes of 25kg.

Utilisation	Sowing Period	Utilisation Period	Days to maturity
Cutting, silage, cover	Spring & Autumn	Summer & Winter	70-100 days

Delivers rapid soil coverage, highly productive and rich in protein.

BARVICOS fixes large amounts of nitrogen. It can be used for green manuring and annual forage production either alone or in a mixture with grasses.

It has vigorous growth and is winter hardy. It will establish and grow well on most soil types, helping to soak up nutrients and hold in the soil for use by spring cropping or reseedling.

It can be typically used 70-100 days after sowing, when 30-50% of the plants have flowered.

Advantages

- Deep rooting and improves soil structure
- Rapid soil coverage
- Highly productive and protein-rich forage variety forage variety

- Can be sown either as monoculture or as part of mixtures with other species, such as clovers and annual grasses
- Good resistance to colder temperatures
- Good resistance against diseases

Dairy Beef Sheep

Sowing rate:

Sown on own: 16-20kg/acre (40-50kg/ha)

Companion plant: 8-10kg/acre
It is recommended to sow a vetch at a depth of 2-3cm

Pack Sizes:

Available in pack sizes of 25kg.

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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.



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