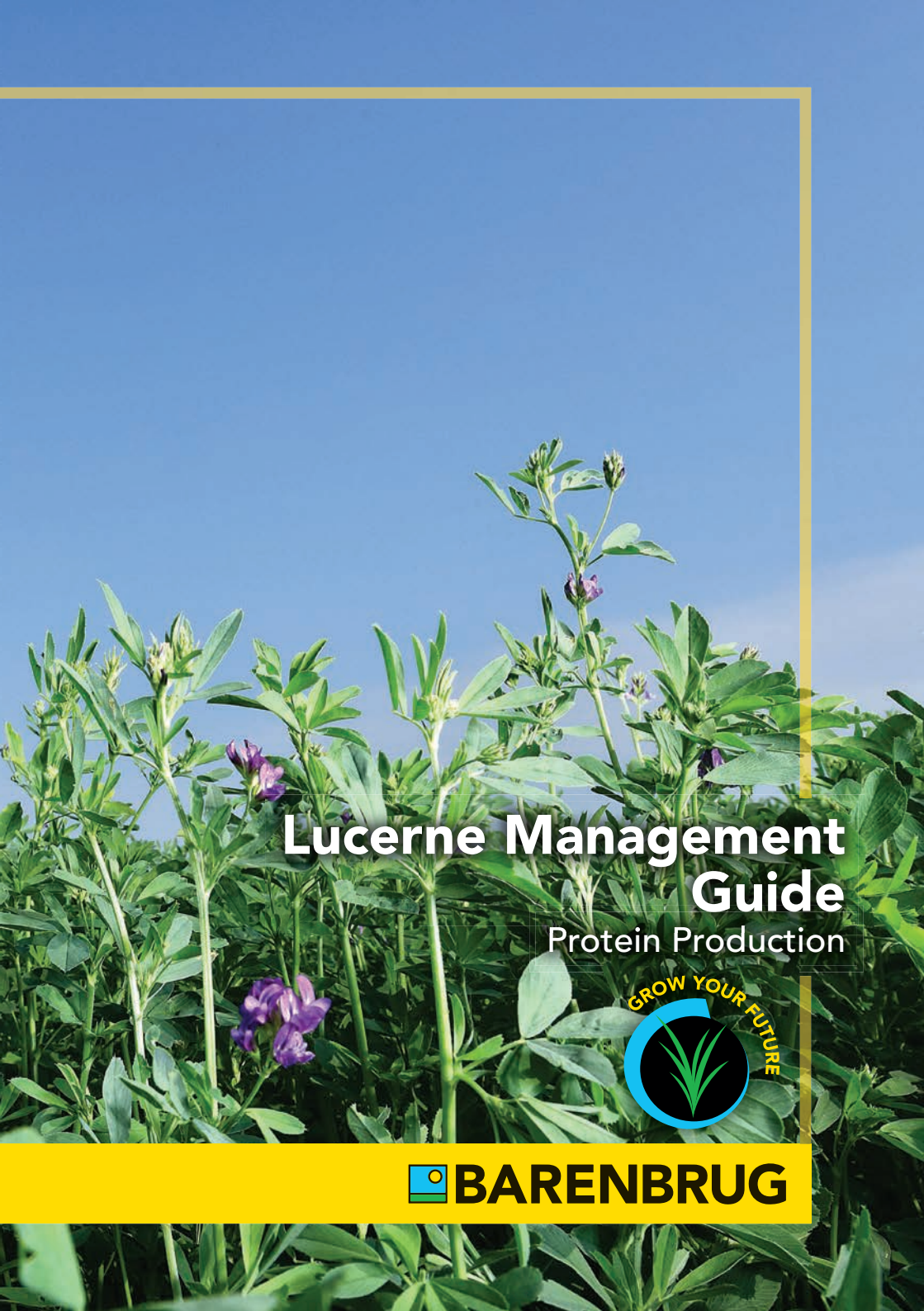
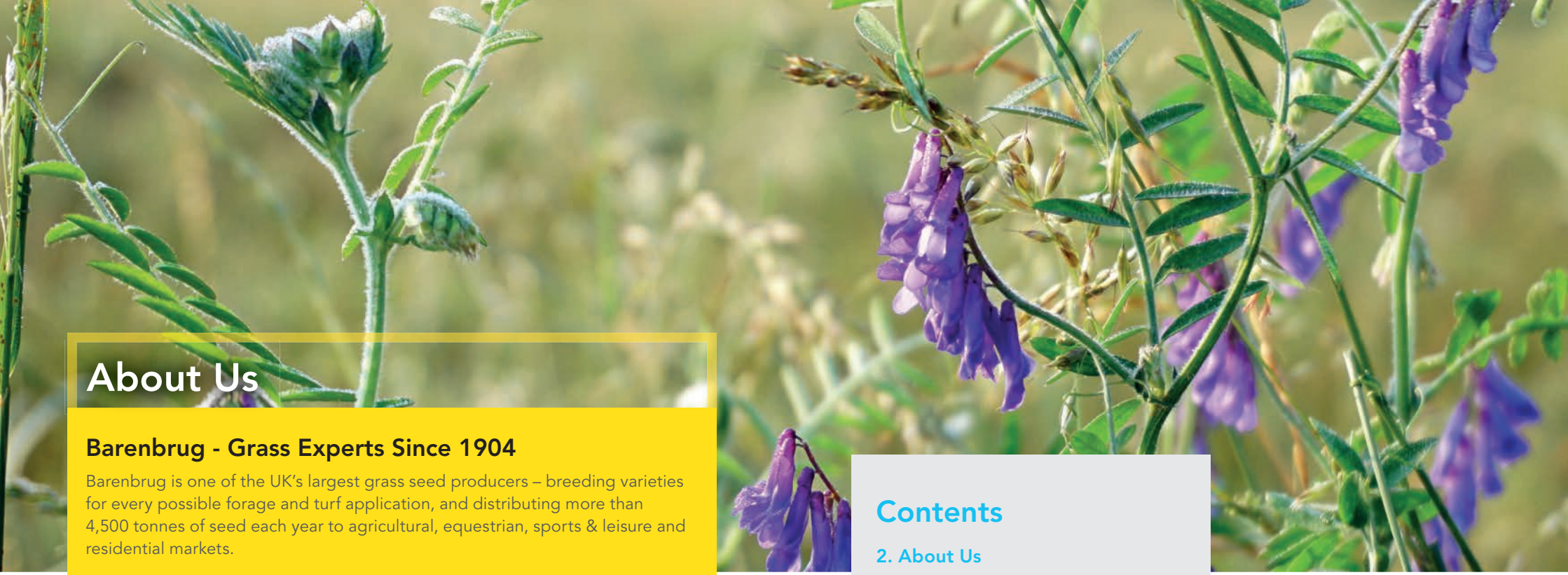


Lucerne Management Guide

Protein Production

GROW YOUR FUTURE

BARENBRUG



About Us

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, sports & leisure 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 trial sites throughout the UK. The company has ISO9001 certification plus Soil Association accreditation for its organic varieties.

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Why Grow Lucerne?

Lucerne (Medicago sativa) more commonly known as alfalfa in America and by the equine industry, is thought to have originated in Southern Asia. Lucerne is now an important forage crop across many areas of the globe with different types of Lucerne having developed and bred for different climatic zones.

For the UK, and northern Europe, we rely on Flemish types which have a dormancy class between 2.0 and 5.5. These types are better suited to our cooler climate. It is estimated there is approximately 600,000 ha of land suitable for the growing lucerne in the UK which is around 3.4% of the utilisable agricultural area.

High Yielding

Lucerne can produce 14t DM/ha achieved over three or four cuts per year. Being slow to establish, because the plant is investing in development of its root structure before its leaf canopy, second and third year yields often out-perform year one. In appropriate soil and climatic conditions and where well managed, lucerne crops will persist easily for 4 – 5 years.

High Nutritive Quality

Typical protein levels in lucerne are 18% - 22% with an ME of 10MJ/kg DM. Lucerne also produces highly digestible fibre which benefits by stimulating saliva production for acid buffering and also creating 'scratch factor' for healthy rumen function.

Drought Tolerant

Lucerne grows straight tap roots which are commonly found at 2 – 3 meters deep dependant on the soil profile but have been reported as deep as 15m. The crop prefers sandy free draining soils that do not suffer from waterlogging making an excellent choice for fields of that type.

Low N - Input Crop

In terms of Nitrogen, it is only ever recommended to apply a maximum of 50kg N/ha (40 unites/acre)* at establishment on soils with a very low soil nitrogen status. Otherwise, no Nitrogen is required and in fact, applying N can inhibit the plants root nodulation and subsequent N-fixation capabilities. Lucerne can fix up to 250kg N/ha (200 unites/acre) per year and will leave residual N for the following crop in the rotation.

*AHDB Nutrient Management Guide Section 3, 2020

Environmental Beneficial

Introducing lucerne to the rotation can provide several environmental (and economic) benefits to the farm. Low N crop requirement reduces the fertiliser volumes required and any related losses and the ability of high legume silages to reduce rumen methane production means a drop in emissions. The deep rooting nature can bring about increased soil stability and improved organic matter levels in light soils and the higher protein ration could reduce the requirement for bought in feed. The flowers are highly attractive to bees and other pollinators.

Establishing & Growing Lucerne

First consider if lucerne is suitable for your local climate. The highest growth rates with lucerne occur during 10OC and 30OC although the crop is frost tolerant. Lucerne is best established between April and May in spring and in August in autumn; does that fit within your current rotation? Spring sowing is preferable to give a longer season for establishment.

Field selection is critical for a successful crop of lucerne. The crop prefers alkaline soils so soil pH MUST be maintained above pH 6, preferably 6.5. Lucerne will tolerate up to pH 8.5.

Always choose free draining fields with lighter soil types and fields that do not suffer from any waterlogging in winter.

Allow a 5-7 year break between lucerne crops to prevent a build-up of pathogens which affect the crop.

Lucerne can be established as a monoculture or with companion grasses. When establishing as part of a mixture, choose species that are slower to establish to prevent outcompeting the lucerne seedling for example, soft leaved tall fescue.

Sowing

When:	April/May or August. Soil temperatures must be a minimum of 8^{O}C.
Rate:	As a monoculture - 8–10kg/acre with a target established plant population of 250-300 plants/m^2 or as a mixture; 6-8kg lucerne and 3kg grass (may vary with species).
Depth:	5–12 mm, potentially up to 20mm on very light, dry soil. Rows should be 10-12cm apart. Roll well.
Seed bed:	Fine, firm, moist and very clean with a pH of 6.5-7.

Crop Management

- Phosphate doesn't need to be applied after establishment, unless the soil is particularly deficient
- Regular applications of potash are recommended. Slurry is an excellent source of potash and is very cost effective if applied at under 25 tonnes/ha. Slurry should only be applied to a crop which is not actively growing
- Lucerne has a high demand for sulphur and an application of 25-50kg/ha of sulphate is required ever two years

Lucerne has a requirement for Boron and Calcium although high pH soils generally don't need further calcium supplementation

- Lucerne cannot tolerate competition; early weed control with the appropriate herbicide at the seedling stage is essential for successful establishment
- Lucerne seedlings are vulnerable to attack by Sitona weevil larvae, slugs and leatherjackets when growing conditions are unfavourable and an appropriate method if control should be conducted if necessary
- The main disease threat to lucerne is Verticillium wilt and resistant varieties should be sown
- Crown rot can occur after very heavy dressings of slurry, damage by overstocking, or by flooding/waterlogging of the field

Harvest & Yield Advice

Although lucerne can be grazed, it is most useful as silage and for zero grazing systems. It has very strong regrowth, depending on the availability of food reserves which are stored in the roots. Harvesting just at the beginning of flowering should ensure sufficient food reserves are present for a good regrowth of the crop.

Harvest Recommendations

- The best time to cut lucerne is when around 10% of the plants are flowering
- When harvesting, leave a stubble length of 7-10cm. Lower cutting heights will kill the new sprouts
- The best time of day to cut is late morning – early afternoon when sugar concentration is at its highest and when any dew has dried up
- Do not cut in wet conditions as lucerne is susceptible to damage from traffic
- Make sure the plants are able to recover following the final cut before they go dormant in the autumn
- Do not cut the crop frequently at a very young stage as this will damage the crop and reduce its persistency to only a couple of years. It is better to cut at least twice a year at the beginning of flowering (5-10 % of total crop on flower). If the crop is weak, allow it to fully flower before cutting to ensure maximum persistency. This will not adversely affect the feed value as the digestibility and palatability are less likely to fall in comparison with grasses
- Each tonne of dry matter removes 8kg P and 30kg K, so apply an appropriate volume of lucerne fertiliser after each cut

Cutting Frequency

- The first, spring cut, should be at around 40 – 45cm tall to maximise quantity then allow 35-42 days for recovery. The spring cut will provide around 35% of the annual volume
- The summer cut will be shorter, around 35 – 40 cm tall. Leave for at least 42 days before the next cut. This cut is likely to also provide around 35% of the total annual yield
- The autumn crop should be left to harvest until at least 50% of the plants have flowered, ensuring root reserves have been replenished. This cut will account for 20% of the annual yield
- The final, winter cut should be considered a management cut, and occurs only once frost stop the plant growth and the plant is dormant

Silaging

The quality of fermentation of the crop and subsequent lucerne silage feed value will be greatly improved by aiming to achieve the following:

- Harvest at 30-35% dry matter
- Growers should be prepared to wilt for up to 48 hours. The leaves contain 70% of the protein and 90% of the vitamins and minerals so it is essential that any leaf loss should be minimised
- Chop to 3 – 4cm chop length
- Compressing and closing the clamp as soon as possible will ensure a good fermentation process
- For big baling, lucerne should be wilted to 40-60% dry matter before wrapping. Mature crops with lignified stems are liable to puncture polythene, so bales should be wrapped at the point of storage, well wrapped, handled carefully and stored on the ground, not heaped

Typical Lucerne Silage Analysis	
Dry matter	36%
Crude protein	18.75%
D value	71.0
ME (MJ/kg DM)	10
pH	4.2

Officially listed in:	France and Switzerland
Bred in:	Connantre by Barenbrug France
Dormancy:	4.4
Attributes:	High yielding, persistance, high winter hardiness, high resistance to verticillium wilt

Artémis
Rated as No.1 on French "Liste A"

Dry Matter Yield

The number of cuts in the sowing year (spring sowing) will be limited to two to three cuts. The dry matter yield in the first year will about 6-9 tonnes until the crop is fully established. In subsequent years, you can expect up to 14 tonnes from a well-managed crop.

In the second year the total dry matter yield can vary between 12-17 tonnes depending on the dormancy class of the variety. Varieties with a high dormancy class will give more cuts per year resulting in a higher dry matter yield.

As with any other forage species, the balance between yield and quality can be influenced by cutting at different lucerne at different growth stages. Lucerne is a highly nutritious forage for livestock combining good digestibility with high proteins providing excellent milk yields or daily live weight gains. A more mature hay crop would be more suitable for feeding young stock or dry cows with the younger silage crops being allocated to the most productive animals.

Lucerne Silage	Early Cut	Normal Cut
Crude protein (g/kg dm)	210	172
Crude fibre (g/kg dm)	228	303
Crude ash (g/kg dm)	139	119
Digestibility organic matter (%)	70.5	64.5
Dry matter intake (kg)	14.2	13.3

In the UK, there is no recommended list for lucerne, only a limited descriptive list in the NIAB booklet so we can look to the French recommended list for guidance, Artémis has been on the French Liste A since 2010, as the highest yielding Lucerne variety. It is a very persistent crop with outstanding resistance to nematodes and diseases.

Top Yields With Yellow Jacket Rhizobium Coating

Artemis seed is supplied with Yellow Jacket Rhizobium coating, Barenbrug's enhanced seed coating for lucerne, designed to improve establishment and increase forage production.

Using new technology, high levels of effective Rhizobia (R. meliloti) are embedded in a protective polymer matrix, which also includes a nutrient booster containing all essential minerals and trace elements. Yellow Jacket delivers:

- Improved establishment under difficult conditions
- Better use of available water and soil moisture
- Increased disease resistance, forage and protein yield
- Improved nitrogen fixation

YELLOW JACKET®
ENHANCED SEED COATING

	Total Annual yield	First cut yield	CP
French List 2020	17.4 t DM/ha	6.3 t DM/ha	18.9%

	Total Annual yield	First cut yield	Second cut yield
Cropvale UK (2019) (*1 only 3 cuts in 2019)	31.76 t FW/ha*1	9.67 t FW/ha	15.75 t FW/ha

Our team

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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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