



GROWERS GUIDE TO LUCERNE



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INTRODUCTION

A minority crop in the UK. Lucerne attracts particular attention following periods of relative drought.

Lucerne's extensive root system enables the crop to produce good yields even under relatively dry conditions. It's perennial nature means that once successfully established reliable production could be expected for the following 3 to 4 years.

With a lower cell wall content than grass Lucerne is highly digestible and intake tends to be high.

Protein and mineral contents are also high making Lucerne a valuable alternative forage. It is particularly suitable as a complementary feed when fed alongside maize silage.

SITE AND SOIL SELECTION

Lucerne can be grown on a wide variety of sites and soil types. The main criteria is to establish on a site where a fine and firm seedbed can be established. Lucerne will not in general tolerate a waterlogged soil and this is commonly the cause of die out over winter. For this reason heavy sites tend to be avoided. Well draining heavier soils however can provide very successful sites where good seedbeds can be established and compaction is avoided.

SOWING DATE

Lucerne can be sown from April right through the spring and summer. Sowings in the late summer will result in heavier crops in the following spring. However, the later sowings carry a greater risk of establishment failure due to the onset of cooler growing conditions in the autumn. Failure to enter the winter with strong plants is likely to result in excess winterkill. For this reason crops in the Midlands and further North are better sown in the spring. Crops in the Southern half of England however can be established with great benefit in the summer. The latest safe sowing date should be considered to be 1st September. Remember sufficient soil moisture is essential for generating successful establishment and this can be a problem with summer sowings.

pH

Lucerne is one of the few crops which will thrive on a soil with a high pH. Adequate lime levels are essential for a successful crop and liming to pH 7 is advised. Acidity will not be tolerated.

FERTILISER

In general Lucerne requires no nitrogen either in the establishment or subsequently. Lucerne is a legume and as such is able by association with bacteria to fix nitrogen into the soil for its own use. It will leave residual nitrogen for use by subsequent crops. However if the Lucerne is following a particularly nitrogen hungry rotation (e.g. cereals) a small quantity of nitrogen may be beneficial in the seedbed (50kg/Ha maximum). If slurry is applied before drilling this usually provides sufficient nitrogen in organic form. Excess nitrogen application will inhibit root nodulation and reduce the Lucerne's ability to fix nitrogen into the soil.

A strongly growing crop of Lucerne will remove approximately 150kgs/Ha Phosphate and Potash annually. This should be replaced to maintain soil levels by smaller applications after each cut or a single application after the last cut of the summer. Apply fertiliser immediately after cutting to avoid leaf scorch on the new leaf growth.

ADAS Recommendations Soil Index	PHOSPHATE (PL05) KG/HA				POTASH (K20) KG/HA			
	0	1	2	3	0	1	2	3
Establishment	120	80	50	30	120	80	50	0
First Cut	100	80	50	30	150	120	90	30
Subsequent Cuts	100	80	50	30	120	90	60	30

All fertiliser should be applied according to requirements based upon soil analysis prior to sowing. Trace elements may be deficient on light soils and attention should be paid to the availability of MAGNESIUM, SULPHUR, MOLYBDENUM, and BORON. These can be particularly important at the establishment phase.

INOCULATION

Treatment of Lucerne seed with Rhizobium bacteria is essential prior to sowing in order to ensure successful root nodulation and efficient nitrogen fixing. Inoculation is a simple process involving mixing the seed with a powder and water.

The mixture is allowed to quickly dry before drilling.

SOWING RATE/DEPTH

Sowing rates vary from 8-15 kgs per acre (20-37 kg/ha). Lucerne has very tiny seed and is best drilled at no more than 1cm deep. Drill into moisture in 10cm rows. Sowing too deep will result in failed emergence. Fine firm seedbeds are essential and rolling after drilling is advised. Broadcasting seed is an option and has the advantage of ensuring seed is not placed too deep.

WEED CONTROL

Lucerne is a very uncompetitive crop in its early growth stages. It will not tolerate weeds and control is essential if infestation is serious.

Summer sowings are likely to have less weed competition than sowings in spring. They also enable cheaper sterile seedbed techniques to be used.

Light infestations are likely to be removed in the first cut and smothered by the re-growth. This however is very dependent upon successful initial population establishment.

Approved chemicals for use on Lucerne are limited and specialist advice should be sort regarding those products with clearance for use.

Perennial weeds should be controlled as far in advance of the crop as possible.

COMPANION SPECIES

As indicated in the weed control notes Lucerne is very uncompetitive. It is for this reason and the desire for a successful Lucerne population that most growers choose to sow to a pure stand only. There is however a number of growers who will sow Lucerne with a companion of relatively non- aggressive Timothy, Meadow Fescue or Cocksfoot grasses. Where grasses are sown they should be drilled at no more than 1kg per acre (Timothy) or 2kgs per acre (Cocksfoot) in order to minimise competition.

PEST AND DISEASES

There are very few chemicals which can be used on Lucerne to control any pests or diseases. The problem is compounded by the inability to enter and travel through the crop once it is actively growing, unless tramlines are used at establishment.

Weevils - may attack at an early stage in establishment biting off young shoots. (Pyrethroids may be used).

Aphids - may infest later but no chemical approval exists for control at present.

Slugs - a potential problem at initial establishment. These should be monitored and slug pellets used where required.

Eelworm - (*Ditylenchus dipsaci*) can cause persistency problems and where infestations in the soil are known to occur, varietal resistance is the only practical solution. Eelworm is more prevalent of heavier soils.

Always use fumigated seed to avoid importing Eelworm to your soil and crop.

Verticillium wilt - There are no chemicals available for the control of this disease. Varietal resistance is the only option.

ROTATION

For crop cleanliness purposes a rotation of 5 years is advised between Lucerne crops. Crops may be down for 3-4 years depending upon the durability of the stand.

HARVEST

The first cut will usually be in late April/May depending upon season and location. The cutting cycle will usually be approximately 40 days and cuts should be taken at the set of the flower buds. Delaying cutting will result in lower quality more fibrous material being harvested and a lower feed value. Cutting pre-flowering will yield 20-22% protein. This reduces to 17-18% when cut once flowers have emerged.

Lucerne has low soluble carbohydrate levels and when ensiled this can lead to fermentation problems. A silage additive is therefore recommended to assist conservation preservation. Because of these difficulties ensiling as Big Bale often proves easier and more successful. If clamp silage is to be made then a good wilt is even more essential, raising the soluble carbohydrate concentration in the remaining sap.

Cut at about an 8cm stubble length the Lucerne should be swathed and wilted. Excess drying will result in loss of leaves and nothing but stalk will remain. Insufficient wilting may lead to effluent problems. A compromise may be reached by wilting until the material on the top of the swath is dry whilst that in the middle is still more green and moist. Bailing at this stage will conserve the valuable leaf material but minimise effluent.

Lucerne is not entirely suitable for grazing as treading causes excessive wastage and damages the plants too severely. Excess grazed intake can also cause bloat.

Light grazing is less likely to cause damage if practiced once the crop has stopped growing into the autumn.

Care should be exercised to avoid damaging the plant crown growing points as this can induce Lucerne crown rot. This disease can also be a problem if excess slurry is applied.

LUCERNE VARIETIES

It is clear that not all Lucerne varieties in the world will be best adapted to the cooler wetter climate of the NW European winter. The plants will be exposed to the cold winter months, prolonged periods of wet soil and in places intense pest and disease pressure.

Varieties for use in the UK therefore need to be selected with care in order to maximise their opportunity for DM and protein production.

One of these varieties, called Marshal, has now been grown successfully in the UK for a number of years. It's high DM yields, persistency and good drought tolerance makes the variety ideally suited to UK conditions.

SUBSEQUENT CROPS

Lucerne leaves a nitrogen rich soil behind it. A following wheat crop would require up to 70% less applied nitrogen than a wheat crop in a cereal rotation. Some N benefit will be seen for up to 3 years afterwards.

SUMMARY

Why Grow Lucerne?

- High protein forage
- Drought tolerant
- Highly digestible
- 3-4 years continuous production
- Good mineral content
- Nitrogen benefit for subsequent crop

Typical Yields and Feed Quality

Average Dry Matter yield	=	10-12 tonnes/ha/year
Average fresh yields	=	35-40 tonnes/ha/year
Dry Matter	=	30%
Crude protein	=	18-21%
Digestibility value	=	70D
Metabolisable energy	=	10 MJ/kg DM

Typical Costs and Value

Cost per acre	£594 (£1459/ha)
Cost per tonne fresh weight	£37
Cost per tonne utilised dry matter	£140
Relative value £/tonne DM	£134
Cost per litre of milk	6.7p
Cost per kilo of live weight gain	44.5p