



Lucerne (*Medicago sativa*) Technical Note F18

Management level	★★★
Yield	★★★★★
Quality	★★★★★★
Water use efficiency	★★★★★
Reliability	★★
Versatility	★★★★★★

Where ★★★★★ is the highest rating.

Overview

Highly productive, deep rooted legume which provides high quality forage (king of fodders). Excellent for grazing and conservation as silage and hay. Useful to restore organic matter and N in old cropping soils. Lucerne tolerates moisture stress, the crown remains dormant and produces a new shoot following rainfall or irrigation event.

Varieties

Many varieties available, grouped on bases of winter growth and disease resistance. Winter active and semidormant types preferred in Queensland.

Semidormant: Grows significantly slower in winter than summer. Growth can stop for short periods. Autumn and spring growth is quicker than winter dormant varieties. Are generally more leafy and have broader crowns than winter-active varieties. (e.g. cv. SARDI 5).

Winter-active: Maintains growth during winter, growth rates after harvest are quicker than dormant varieties. They have fewer tillers, narrower crowns and larger leaves. (e.g. cv. SARDI 7).

Highly-winter active: Fastest recovery after harvest, the most winter growth. Lowest persistency due to depleted energy reserves. (e.g. cv. SARDI 10).



Establishment

Alluvial and sandy clay loams most suited, deep scrub soils. Must be well drained. A fine, firm seedbed essential, weed free and moist. Weeds controlled during previous crops and fallow. Winter preferred planting time, or spring if summer weeds are not a problem. Can be sown during summer in pasture mixes.

Planting rate 8 kg/ha dryland, 15 irrigated and 2 - 4 kg/ha in pasture mixes. Always use Group AL lucerne seed inoculants. Surface sown, lightly covered (12 - 25 mm) and rolled. Often roll before and after spreading seed. Can be drilled to a maximum depth of 50 mm. Can also undersow with winter cereal if reduce cereal rate.

Primary weeds are annual grasses including barnyard, feather top Rhodes and urochloa, and perennials such as Rhodes, couch, paspalum, green panic, Johnson and nut grass. Monitor germination of weeds, use herbicides when necessary and grass plants are young.

Water use

Ideally seedlings should remain unstressed until first cutting, apply frequent light applications <25mm. Once established lucerne has a high water requirement equivalent to 0.75 - 1.0 ML/ha/cut, up to 12 ML/year depending on environment (at 8 ML rainfall, irrigation is required to supply the remaining 4 ML). Lucerne is very susceptible to waterlogging because it is very susceptible to root rot.

Water requirements (ML/ha) for lucerne have been calculated based on the sum of evapotranspiration rates less rainfall for 12 months averaged from 1970 to 2007 (ICalc).

Location	ML/ha
Beaudesert	6.3
Gatton	7.3
Gympie	5.0
Monto	8.0

Soil fertility

Requires neutral pH. Apply lime if pH below 6. P soils may be adequate but an application at planting may boost seedlings. High K removal means will be needed. K deficient plants less tolerant of fungal diseases. N not usual, 50 kg after germination may boost winter active varieties.

Nutrient requirements

Nutrient requirement	N	P	K	Ca
Nutrient (% DM)	4.8	0.34	2.01	1.31
kg applied (/ha)	150	30	200	170

Typical mineral content of lucerne and requirements to produce 10 t DM/ha utilisation.

Half the amount of N required is applied as fertiliser the remainder assumed to come from nitrification.

Diseases and pests

Lucerne is susceptible to a wide range of diseases and pests:

- Plant yellows and wilts, with brown areas in taproot.
- Phytophthora root rot.
- Spotted alphas aphid very severe in recent years, graze if more than 20 aphids/stem. Chemical control may be required if making hay.
- Blue green aphid and pea aphid can be a problem sometimes.
- Crown rot (anthracnose) common during wet periods, blue-black discoloration in crown and tap root. Select resistant varieties and grow lucerne in a rotation with grasses.
- Leaf spot more evident in winter active varieties, graze when obvious.
- Helioverpa (heliopsis) usually only a problem with seed crops.
- Leaf roller reduces vigour during summer in more mature stands, graze to remove.
- White fringed weevil. The white maggots feed on the tap and secondary roots. Control by rotating lucerne with grasses.
- Jassids – bright green (vegetable) or yellowish green (lucerne) produce a stipple pattern on the leaves and a yellowing of leaves respectively. Graze to remove.
- Cutworm larvae can thin and cut off seedlings. Large, soft brown larvae in surface soil, easily controlled with insecticides applied late evening. A wide range of chemicals available for pest control.

Weeds

Except in pasture mixes important to keep other species to a minimum.

A wide range of chemicals available to use for weed control, for pre emergent, grass and broad leaf weeds. Generally a strong stand of lucerne will dominate weeds and prevent invasion.

Growth and grazing

High crown and is sensitive to grazing, and requires rotational grazing with 6 - 8 week spelling. Aim for a residual height of 15 cm to avoid overgrazing. Expected yields 5 - 10 t DM/ha under raingrown and 16 - 20 t DM/ha/year with irrigation. About 70% growth occurs in spring and summer. Winter dormant types have lower crowns and are more persistent under grazing. Typical life of stand is 3-5 years, longer if grass invasion accepted.

Nutrient quality

Quality (% DM)	Pasture	Silage	Hay
Crude protein	26.4	23.5	21.4
Starch	4.5	2.5	1.8
Sugar	11.4	9.2	8.7
NDF	31.7	39.8	40.9
Fat	3.4	2.7	2.4
ME (MJ/kg DM)	10.8	10.1	9.6
DM (%)	25.1	66.3	88.6

Range in quality for lucerne when grazed, and harvested for silage and hay.

Animal health

Bloat from grazing is the major health problem with feeding lucerne and it needs to be routinely managed. Control is through avoiding having cows hungry, keeping lucerne to <20 - 40% of the diet, include oils in the ration (whole cotton seed) and if necessary by dosing with bloat oils (20 - 40 ml/cow), spraying oil on lucerne (60 - 100 ml/cow), or supplying a feed additive such as rumensin (in feed or as a capsule). Grazing when more mature and having grass mixed in with the lucerne also reduce bloat risk.

Silage and hay

Can be cut 6 - 8 times a year under irrigation, producing 15 - 20 t DM/ha. Dryland 2 - 5 t DM/ha/year. Cut at early flowering or when new growth buds form from the crown at 3-5 cm. Continual earlier cutting will weaken the stand.

Advantages of silage – less weather dependent because less time in the paddock, and less leaf loss in the field from further drying and tedding.

Alternate winter forages

Can be oversown with ryegrass in autumn, especially in declining swards.

Further information

Contact the DAFF Customer Service Centre by Phone 13 25 23, or Email callweb@daff.qld.gov.au

More technical notes can be found at: www.dairyinfo.biz

Bullen (2004). Lucerne management handbook.

Lake (1995). Dairying Technical handbook.

Callow et al. (2013) Successful Dairy Production in the Sub-Tropics

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