



Managing Pastures - Readers' Note

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Grazing management—lucerne

Lucerne is a perennial legume capable of producing feed throughout the year, but its main production period is from spring to autumn. It is a high-quality feed with no requirement for nitrogen fertiliser.

Varieties fall into 4 growth types: highly winter-active, winter-active, semi-winter-dormant and winter-dormant (Figure 11 shows 2 of these).

Lucerne's biggest asset is its well developed taproot, which can extend to well over a metre in well drained, fertile soils. The taproot enables the plant to reach nutrients and soil moisture much deeper than most other pasture plants can reach, giving it a well deserved record of drought resistance.

Carbohydrate reserves are held in the main taproot. Lucerne is often quicker to recover after cutting or grazing than grasses because its taproot has more energy for regrowth and does not die after grazing or cutting, unlike many grass roots.

After the plant is grazed or cut, fresh shoots grow from either the remaining green stems or, most commonly, buds in the crown. The crown is the part of the taproot at or just above ground level. Heavy grazing can damage the new buds, but in most varieties these are rapidly replaced. Lucerne can live for 10 years or more, although the life of an average irrigated stand is closer to 4–5 years. As lucerne paddocks age, grazing damage, weed invasion, disease and insects take their toll, and the stand thins out.

Table 3 shows optimum plant densities for lucerne. Lucerne stands with lower plant densities than those will have reduced yield and will tend to be invaded by weeds; this will result in lower-quality feed. Direct drilling of other pasture species (for example, ryegrass and clover)

Figure 11. Highly winter-active lucerne yields more in summer, autumn and winter than semi-dormant lucerne, but yields less in spring.

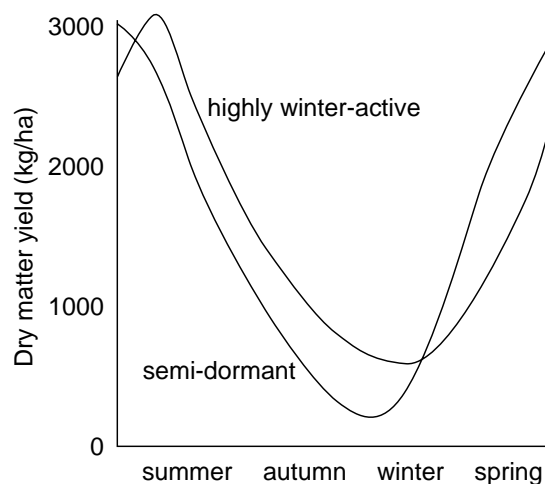


Table 3. Optimum plant density in lucerne stands for maximum yield.

Age of stand	Optimum plant density/m ²
Seeding year	>180
1 year	100
2 years	70
3 years and after	50

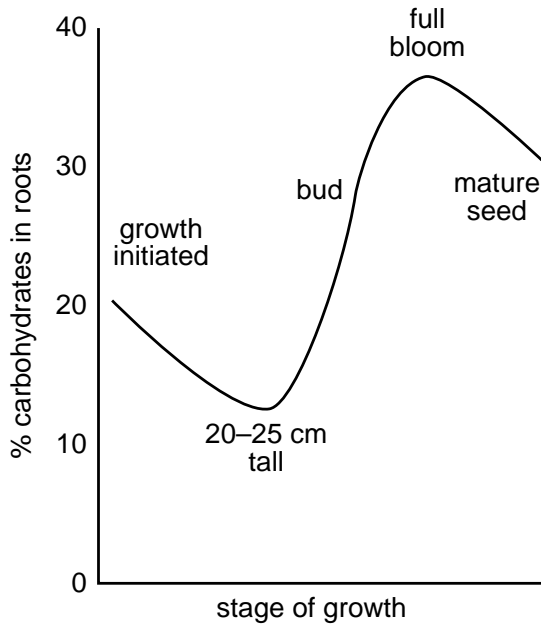
into thinning lucerne stands can help maintain the productivity and quality of feed in the paddock.

When to graze

The optimum grazing interval depends on the growing conditions in your area.

To promote good productivity and persistence of lucerne, root reserves have to be allowed to build up. Lucerne is well adapted to cutting or grazing, provided an adequate recovery period is given to allow essential root reserves to be replenished. Without these reserves, rapid regrowth after grazing is not possible, and survival,

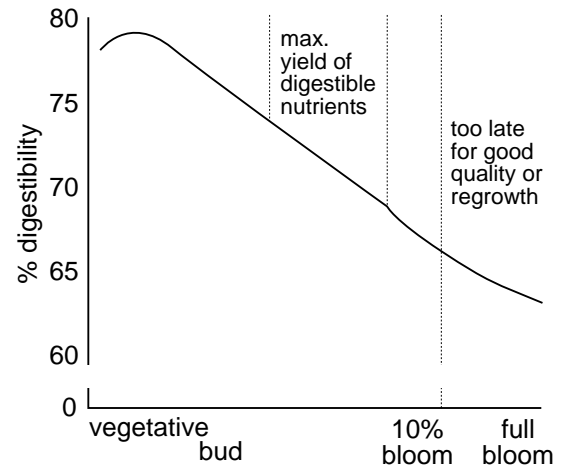
Figure 12. When growth begins, root reserves are mobilised and are used by new shoot growth for about 15 days after defoliation. This process continues beyond the time when new leaves begin sending reserves back to the roots (about 5 days after defoliation). Root reserves reach a minimum at about 3 weeks after harvest and reach maximum at full flowering.



particularly through stress periods, is threatened. Frequent removal of new shoots from lucerne plants depletes the essential carbohydrate reserves. Figure 12 shows the changes in carbohydrate root reserves in lucerne from harvest to full seed set.

By the time full flowering is reached, the stem is thick and the plant has already begun to drop leaves; this reduces both quality and yield. The maximum yield of digestible nutrients is obtained **before** full flowering (Figure 13). Cutting or grazing

Figure 13. Digestibility of lucerne decreases as the plant matures.



management is often based on the 10% flowering stage, which is considered an easily identifiable growth stage; this gives the best compromise for achieving high yields, adequate quality and persistence.

New varieties, including winter-active and highly winter-active lucerne, regrow faster after cutting and reach harvest maturity earlier than the more dormant types.

During winter in warmer climates, the more winter-active lucerne types can continue growth with very little or no flowering. Studies by K. Lowe at the DPI in Queensland showed that in spray-irrigated lucerne stands, the fixed cutting intervals shown in Table 4 achieved high yields, good quality and adequate root reserves. The same studies showed that cutting intervals were more important than cultivar type in determining yield. Grazing or cutting intervals more frequent than these substantially depleted root reserves.

Table 4. Fixed cutting intervals (in weeks) for lucerne types in spray-irrigated stands in Queensland to achieve the optimum balance of yield, quality and root reserves.

Season	Variety types			
	Winter-dormant	Semi-dormant	Winter-active	Highly winter-active
Summer	5	4	4	4
Winter	8	8	7	7

Longer intervals reduced forage and nutrient yield.

Root reserves are lowest in late summer. This reduces autumn – early winter production. Delaying cutting or grazing in late autumn allows lucerne to flower, which helps prevent run-down of root reserves.

Trampling and grazing damage crown shoots and allow disease entry. Therefore you should cut lucerne for hay or silage (not graze it) for as long as possible (particularly in the first 12 months) to maintain the plant population. Strip-grazing with back-fencing is necessary to prevent excessive crown damage. The narrower crowns and higher basal buds of the more winter-active lucerne varieties predispose them to greater crown damage.

Lucerne is more susceptible to pugging and trampling in wet weather than many other pastures. Grazing lucerne paddocks should be the **last option** in wet conditions.

Pest and disease incidence will influence grazing management. Early grazing can be justified to control both aphids and leaf diseases.

Cows grazing lucerne are susceptible to bloat. Lucerne can contain high amounts of plant oestrogens (which can cause animal reproductive disorders) if

leaves are stressed by disease or insect damage.

Lucerne in a mixed pasture

Lucerne is sown mostly as a sole species, because of its use as a specialist hay crop and its specific grazing or cutting regimes, which do not suit other companion species. There are 2 alternatives: to favour the lucerne with long grazing intervals, which allows the companion species to grow past its best; or to graze the lucerne too frequently, causing a progressive run-down of root reserves and reducing its persistence. When lucerne stands of declining vigour are oversown with ryegrass, grazing management should aim to maximise utilisation and persistence of the ryegrass at the expense of the lucerne.

Yield

The maximum potential yield of well managed lucerne stands has been estimated at more than 25tDM/ha. Commercial yields are generally 12–18tDM/ha from 5–7 grazings between early October and late April.