

Seed Force lucerne

 **Seed Force** 
the power to grow

Sustainable production you can **count on**

Used for centuries across the world as a high value animal feed. Today, the modern genetics of the ancient alfalfa (lucerne) is powering farm productivity all over New Zealand.

Seed Force's lucerne systems are resilient, reliable and extremely productive. The signature long tap root grows deep, reaching groundwater where other species can't. Lucerne is a powerful producer, providing a level of certainty unsurpassed by other forage perennials, year after year.

High production and performance

Lucerne is suitable for many farming systems – not just dryland sheep and beef – and has flow-on benefits for the whole operation.

It can be used on its own or as part of a mix, on irrigated or non-irrigated land, as a grazed option, or for conserved hay or silage.

Lucerne's consistency makes it easier to plan, optimise and predict the output of every hectare.

On the performance side dryland lucerne gives a similar output of lamb weaned as irrigated pasture. The stocking rate is similar to irrigated pasture versus three to four times that of dryland pasture, with more consistent results year on year in stocking rate, liveweight gain (LWG) and per hectare production.

This high protein high performer provides four to five times the lamb production per hectare than dryland grass – while using the same amount of water.

For dairy systems its constant high protein available at times when other feed sources may be limited in quality or quantity is one of its key benefits. This home grown additional protein source can help reduce reliance on imported feeds or supplements and leads to increased animal performance.

LUCERNE'S HALLMARK TRAITS INCLUDE:

**HIGH QUALITY LEAF
(ME >12, PROTEIN >24%)
AND STEM
(ME~8, PROTEIN <14%)**

**HIGH WATER USE
EFFICIENCY
THANKS TO THE
DEEP TAP ROOT**

**CONSISTENTLY
HIGH ANIMAL
PRODUCTION**

**PREDICTABLE
STOCKING
RATES**

**A PERSISTENT
STAND LIFE**

Getting off to a great start

To get the best return on your seed investment, it's important to get the groundwork right. Lucerne likes well drained soil and doesn't like competition from weeds. Root disease such as Phytophthora and others can cause seedling damage as well as reduce yields and persistency.

Before sowing:

- identify suitable paddocks for soil type and end use
- soil test early to ensure a pH>6.0 (150mm probe)
- test deep soil for aluminium if applicable (>1m)
- spray out in autumn
- correct nutrient deficiencies for P, K, S, Molybdenum and Boron (P 20, S 10+, K 6+)
- use crop rotation to remove weeds from paddocks and ensure pests are under control.

Nutrients

A key consideration for stand health and performance is the pH level of the soil, as this will aid establishment and allow optimum nitrogen fixation by the plant, setting the stand up for a long and productive lifespan. This should be tested well in advance (six to twelve months prior to planting). For every tonne of lime applied will generally increase the pH level by 0.1 units which takes a long time to become effective.

Optimum pH of the soil also helps ensure key nutrients required by the plant are available for production. These nutrients are important for a range of plant functions. Potassium keeps the plants healthy and productive and the plant's demands increase as it grows, Sulphur and Molybdenum enable protein formation and development and Molybdeneum is also important for *Rhizobia* function, while Boron is crucial for plant functions. Calcium and Magnesium are both important for plant nutrition.



Nitrogen fixation

Like other legumes; lucerne's nitrogen requirements are met by a process provided by beneficial bacteria called *Rhizobia*. This process is nitrogen fixation where the bacteria convert nitrogen from the atmosphere into a form that the plant can utilise. In return the lucerne plant provides the food source/energy for the bacteria to survive, so it is a beneficial relationship.

This process can provide upwards of 25kgN/ha for every tonne of dry matter that is produced, helping ensure maximum plant production and subsequent quality.

As such the plant does not require applications of artificial nitrogen by way of fertiliser. Establishing immature stands will rely on soil available nitrogen until the *Rhizobia* are effective. The only situation where application of nitrogen at establishment may be needed is continuously cropped paddocks where the available soil nitrogen is too low.

Nutrient removal

As lucerne is highly productive it requires regular nutrient inputs (other than nitrogen) for maximum performance. Key nutrients should be replaced dependent on the system and environment. Soil test annually to determine requirements. For every tonne of dry matter lucerne produces it removes the equivalent of:

- > over 20kg of Potassium (K)
- > almost 14kg of Calcium (Ca)
- > almost 3kg of Phosphorus (P), Sulphur (S) and Magnesium (Mg)

Getting off to a great start

For lucerne growth activity there is an international lucerne dormancy scale of 1–10, where 1 = highly winter dormant, 10 = highly winter active. Your climate and location will determine what type of lucerne will do best on your farm.

Low winter activity cultivars have the longest persistence with little to no cool season growth. Semi dormant types are a good compromise in many locations with good persistence and production. High winter activity types provide more cool season production in suitable environments (up to 20% of their production) but provide shorter persistence due to their increased growth.

- harsh winter locations are suited to lucerne with a low to mid activity rating.
- cool winter locations are suited to the mid-range activity ratings.
- mild winter locations can use higher activity ratings.

Alternatively, areas with a proportion of low to mid activity varieties may wish to include a higher activity in their rotation for seasonal management, e.g. potentially earlier grazing post-winter.

Ensure you select a variety/varieties that will produce the majority of its dry matter at a time of year when it can be utilised. Seed Force has a range of high performance lucerne genetics suited to all systems and regions.



When to sow

Where possible, spraying out and fallowing a paddock well in advance of sowing is an effective way to ensure maximum weed control. If you suspect that perennial or hard to kill weeds are going to be a significant issue in the chosen paddock, consider one or two crop rotations of a brassica or cereal before looking to establish the lucerne. Check the chemical history of the paddock as some chemistry can severely impact lucerne seedling establishment and survival, an example is sulfonylurea herbicides as these can remain present in the soil for up to two years after application.

Typically spring sow from late September to early November, when soil temperatures are above 8 degrees celcius. Timing will be dictated by the local environment and in some areas late summer/early autumn sowings are viable if the soil temperature is 15 degrees or above and there is six weeks or longer before cool conditions slow or stop growth. Lucerne will also benefit from good soil moisture at sowing, as seeds absorb 25% of their weight in water before beginning the germination process.

Before working the final surface in cultivated situations, incorporate pre-emergence herbicide and sow between 8-12kg per hectare of freshly inoculated seed, as lucerne requires specific Rhizobia for effective nodulation (the stand will self-thin over time to suit the environment). Higher winter active lucerne typically requires a higher sowing rate.

Shallow sow at 5-15mm on better soil or up to 25mm on sandy soils in a fine firm seedbed, or if your soil type is suitable you can direct drill.

In its first year ensure the stand has the opportunity to have 50% flowering in the spring. This will allow the plant to develop a sufficient root structure and build energy reserves before the summer, for established stands (older than one year) this flowering period will occur in the autumn.

sheep systems

Maximise lucerne production on your farm with these seasonal tips.

The stocking rate

One of the important things to understand with lucerne is what stocking rate to use and when to start grazing. Researchers at Lincoln University have been studying this for some time and recommend:

- Because lucerne's growing points are at the top of the plant, it should be rotationally grazed.
- Set up a 5-6 paddock rotation.
- Start spring grazing when lucerne is about 15cm tall – the first paddock grazed and sprayed in autumn is likely to be the first ready for grazing in spring.
- Put ewes with lambs onto lucerne as early as you can – the younger the better.
- The exact number of animals to put on is location and spring dependent and will take a year to two to work out. As a guide, Lincoln recommend 12-14 ewes plus twins for 10-12 weeks.
- Paddock 1 needs to be consumed in 3-4 days. There will be little post grazing pasture mass because all of the herbage on offer is leafy rocket fuel.

The first rotation

Once ewes and lambs have started on lucerne, the next question is when to move them onto paddocks 2-6. Paddock 2 will be taller and contain more dry matter than when you started in paddock 1.

To get an idea of how much to leave behind after grazing, test the herbage as animals go in. Find where the woody part begins – this is low quality maintenance feed and not recommended for fast growing stock.

When you enter paddock 4, look to see if recovery in paddock 1 is 10-15cm tall. How this grows over the next two weeks dictates paddock rotation. If regrowth is fast, you may not want to graze paddock 6 but drop it out of the rotation for hay or silage or increase the mob size to cope.

As a guide, the time of return to paddock 1 after leaving should be between 30 and 42 days (or you will have grown too much stem).

Key points: Spring production (Sept/Oct/Nov)

- Set up a 7 to 10-day break.
- 5 to 6 paddock rotation (35-42 days recovery) any less will limit root reserves.
- Post weaning, lambs only eat lucerne leaf, stock at about 70/ha with ewes to follow.
- 2.5-4.0 kgDM/head allowance (increase later in season).
- Minimum of 6 to 8 weeks on lucerne to maximise live-weight gain.
- Delayed harvest increases proportion of stem.
- Paddock 1: start 1,500 kgDM/ha, return at 3,300 kgDM/ha.
- Paddock 2: start 2,200 kgDM/ha.
- Paddock 3: 2,600 kgDM/ha (higher post graze residual: PGR).
- Paddocks 4-6: 3,300 kgDM/ha (higher PGR).

Summer (Dec/Jan)

- Shorter rotation, 30 to 35-day return.
- Water stress can accelerate flowering but leaf is still high quality.
- Conserve a true surplus at this time.

sheep systems

Autumn recovery (Feb/Mar)

- Allow at least 50% of the lucerne stems to have an open flower sometime from mid-summer to autumn, to encourage root recharge.
- Graze if a drought stops plant growth, then allow recovery after rainfall until growth stops.
- Long rotation (42 days) sometime between January and the end of May builds up root reserves for spring growth and increases stand persistence.

Winter (June/July)

- Hard graze with a large mob once frosts stop growth, if mild (no frost) graze anyway to help ensure the ability early spray.
- Apply weed control 14 days later.
- Node accumulation on stems sets up the spring growth potential.
- A late spray or an early 'green pick' drastically delays spring growth and reduces yield, affecting production potential/animal performance in spring and putting pressure on the system.

Animal health - sheep systems

Animals grazing lush lucerne are most prone to health issues as the gut adjusts, but it's important to start grazing lambs on lucerne as young as possible.

Ensure there's plenty of fibre, like good quality meadow hay or ryegrass straw, and salt available. Ewes that have previously been on lucerne are likely to take to it with little adjustment.



Lambs should be protected against clostridial diseases before going onto lush lucerne, particularly in spring. A comprehensive pre-lamb vaccination programme should provide adequate cover in early spring, this may need to be followed up with a further vaccination post-weaning. Fast growing animals are more prone to clostridial disease from rapid bacterial growth in the rumen that can cause sudden death. This is often mis-reported as bloat. Never put hungry stock onto Lucerne.

Red gut is a common issue with fast growing lambs and lush lucerne. This is when the feed passes through the animal too quickly. Good quality fibre can help prevent this and some farmers pre-mow the lucerne before grazing to wilt it before running stock onto a new break. The mown, wilted lucerne is high in both fibre and sugar, making it a highly palatable source of fibre.

High levels of coumestans can lead to stock infertility due to oestrogens produced by fungi in the crop when grazing affected plants during mating. This can be a problem in wet, overcast conditions or if the plants are suffering from leaf disease and is more regularly seen in younger animals. New lucerne or clear and dry conditions are less susceptible. A way to help alleviate issues is to remove ewes three weeks prior to mating.

Common sheep grazing problems and treatments

- > Clostridial bacteria: vaccinate.
- > Cobalt: vitamin B12 injection.
- > Avoid flushing if leaf spots or flowering lucerne – new regrowth or tops only are okay.
- > Redgut problems on high quality feeds: fibre.
- > Na deficiency (0.03%): salt licks/fence-line weeds/pasture. Require 0.11% Na- sheep/beef/dairy.

Seed Force lucerne

dairy systems

One of the key benefits in the feeding of lucerne in a dairy system is its high protein content provided at a time of year when pasture quality can be limited. This is often in the summer when ryegrass based pastures come under climatic pressure and subsequently their quality is reduced. This can often be as low as 10% protein which is well below the dairy requirements of a dairy cow in mid-late lactation (14-16%). This deficit is then filled by way of alternative crops or more commonly by way of conserved feed and imported supplements.

The high quality and protein of lucerne can help fill this deficit cost effectively.

In a dairy system grazed or conserved feed can be included in the diet, with the volume provided dependant on the other dietary components and the daily requirements of the animal.

Grazing

The benefit of including direct grazed lucerne in the diet as part of the milking platform rotation is the reduction of the cost requirements of a cutting and harvesting system. Direct grazed lucerne is part of many dairy systems globally where they successfully integrate the species to help drive animal performance and production.

There are some key tips to help ensure maximum benefit and mitigate animal health risks such as bloat. Grazing entry height should be approx. 30cm, which is higher than a typical sheep system and provides more fibre. Grazing intervals are based on the rate of regrowth.



If paddocks get too long (40cm and above) these can be dropped from the grazing rotation and taken for silage.

To help alleviate the risk of bloat consider pre-mowing the lucerne break prior to grazing. When grazing; back fence the prior break area to ensure animal do not have access to any regrowth.

Animal health - dairy systems

- > Provide salt licks; require 0.11% Na
- > Pre-mow to wilt the lucerne before grazing to avoid bloat
- > Utilise animal health preventatives for bloat such as bloat capsules or oil
- > Back fence breaks to avoid grazing regrowth

Cutting/harvesting systems

If you're using lucerne for hay or silage, be clear about your aim – quality versus quantity versus persistence – as this will determine the cut timings.

- > For a good compromise, cut early for the first two cuts, with the first at bud stage or earlier then 35 to 42 days later (delaying reduces quality).
- > Then successive cuts at 10% flowering intervals.
- > As with grazing systems allow a minimum 50% flower pre-autumn to build root reserves.
- > Time the last cut for when growth stops.
- > Always cut above crown/new buds.
- > Cutting regimes require regular nutrient inputs.



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