Lucerne
Management
Guide

pggwrightsonseeds.com.au
A successful lucerne crop relies on:

1. Planning and preparation of paddocks
2. Successful plant establishment
3. Vigilant early crop management (i.e., pests, disease, nutrition)
4. Continued maintenance of established and mature crops
Who Are We?

PGG Wrightson Seeds have been in the Australian forage seed business since 1938 and introduced the first proprietary cultivar into Australia in 1987. Since this time we have proudly led the development of improved pasture plant genetics in this country.

Research and development across Australasia is key to our success. We invest well in excess of $9 million per annum into our forage and endophyte programmes.

We have relationships with two primary research partners in lucerne and breeding evaluation:

- Alforex
- Forage Genetics International

At PGG Wrightson Seeds we appreciate that there is a lot of information around cultivars. Our aim is to help remove some of the confusion and make your decision easier. Your local PGG Wrightson Seeds Sales Agronomists are always available to help with your decisions. Call your local Sales Agronomist shown on the back cover of this Lucerne Management Guide, call 1800 619 910 or visit us at pggwrightsonseeds.com.au.

Why PGG Wrightson Seeds?

- We have access to world leading research and development
- Animal grazing trials are incorporated into plant breeding
- Staff are practical, focusing on increasing your meat, milk or wool production
- Helping Australian farmers achieve their goals for over 75 years
- We deliver market leading technologies (For example AR37 endophyte, grazing tolerant lucerne and Envirogro® seed treatment process)
Research and Development

The aim of PGG Wrightson Seeds’ lucerne research programme is to collaborate with the world’s leading lucerne Research & Development programmes, sourcing new potential breeding material and to evaluate these so we bring to market only the elite lucerne cultivars that are best suited to the Australian environment. The requirements for a highly winter-active variety for irrigated hay production are clearly different to the needs of broadacre dryland mixed farms. Therefore, the extensive R&D network of PGG Wrightson Seeds aims to assess performance of material under different geographic, climatic and management conditions. Regional trials are designed to compare the many breeding lines with the large number of commercially available cultivars on the market.

Within the PGG Wrightson Seeds lucerne portfolio, you will find a market leading variety that will suit your situation, which has been extensively trialled over many years for proven performance.

The breeding effort is focused on integrating new technologies and selecting for traits that have the ability to withstand our environments and challenges. PGG Wrightson Seeds has a strong history of collaboration with Forage Genetics International and Alforex Seeds (formerly Cal/West Seeds), two of the biggest lucerne germplasm developers in the world. Furthermore, linkages with companies in South America, University of Queensland and internal research projects are all in the pipeline for continued lucerne improvement.

Current Research Trials

**Single row lucerne trial – Stage 1 evaluation – Leigh Creek, Victoria**

**Lucerne trial – Leigh Creek, Victoria**

**Lucerne trial – Moolort, North-Central Victoria**

**Lucerne single row evaluation – Gatton, QLD**

**Lucerne trial site – Tamworth, NSW**
Lucerne (Medicago sativa L.) is a perennial legume and a valuable crop worldwide, often being referred to as the ‘King of Fodders’. It has this reputation because of its high nutritional quality, high yield, persistence under dry conditions, ability to fix atmospheric nitrogen and flexibility of being a dual purpose crop for both grazing and hay, or for specialty hay and silage crops. It is estimated to be adapted to over 30 million hectares in Australia, but the area currently sown is approximately 3.2 million hectares. So the question often asked is ‘why isn’t everyone growing it?’ The role it can play and suitability on each individual farm will be different from region to region. There are certainly some limitations, but it could be argued many of the limitations are often perceptions when it comes to growing lucerne. Some of these include: too hard to establish; limited places or areas of sowing; requires occasional herbicide applications; limited winter growth; doesn’t persist and occasionally some animal health challenges such as poor lamb growth rates and bloat in cattle. However, sound agronomic advice and practice during paddock selection, preparation, establishment and ongoing management for the life of a stand will go a long way in mitigating some of these limitations.

Lucerne has a deep taproot which can extract available water from the soil profile and also has high water use efficiency, making it a very drought tolerant species. It can fix its own nitrogen and is proportional to the foliage grown (approximately 25kg N/t above ground dry matter). Numerous studies have shown the benefits of lucerne based pastures, for improvement in animal production in Australia. This is through increased growth rates and live-weight gain attributed to increases in forage production and quality over the spring-autumn months. It offers high nutritional quality at critical times of the year, in comparison to dry annual pastures over summer which contain less than 8% protein and low digestibility. Lucerne can be as high as 20% protein with high digestibility. Lucerne responds well to summer rains and is very productive under irrigation. Research has also shown that increasing distribution of feed over longer periods can be achieved by sowing lucerne with companion species with different seasonal growth patterns such as phalaris, cocksfoot, tall fescue and chicory. These practices also help to overcome many of the associated animal health issues that can occur in pure swards.

Persistence of a stand is affected by a number of factors which include dormancy group, grazing and/or hay management, soil fertility, drought and weed invasion. Choosing the right lucerne is about selecting the right characteristics for the environment and management system required, with the aim to ensure the stand produces well for as long as it is needed. As lucerne relies on stored energy in its roots to regrow new foliage following grazing/cutting, a simple grazing rotation with minimum recovery periods of 35 days (dependent on seasons) and short grazing periods (5-7 days) will ensure a good compromise between quality, yield, animal safety and persistence. However, often the ‘ideal’ grazing management techniques can be difficult because of various factors. These include size of paddocks or livestock numbers, infrastructure and grazing time required during dry periods (when the only feed available may be the lucerne paddocks). These factors mean that at times lucerne can be over-grazed and stand life depleted. However, the recent release of grazing tolerant lucerne cultivars, which have been developed to withstand continuous and less than ideal grazing practices, offers a significant benefit to producers.

Introduction to Lucerne
The Grazing Tolerance Story

Lucerne will persist and perform well if strict grazing management practices are adhered to. It is well understood that for long-term productivity, lucerne pastures require rotational grazing. Numerous studies recommend a minimum spell period of around 35 days with a short grazing period. These practices should provide a reasonable balance between persistence, quality, yield and animal safety. Nevertheless, many Australian producers find ideal grazing management techniques impracticable and will often graze stands continuously and overgraze paddocks. There are a number of contributing factors for the low rate of adoption for ideal grazing rotations. Paddocks are often too large and there are high costs associated with subdividing and watering in broad acre pasture systems; additional management is required and the benefits of rotational grazing are not well understood or demonstrated clearly enough in Australian pasture systems. However, perhaps the greatest obstacle to adoption is that over a very long dry summer, when the only green feed on the farm is lucerne, producers will often and understandably leave their valuable stock on the lucerne for extended periods despite the known consequences.

Continuous grazing or set-stocking of a lucerne stand through hot and dry periods subject the plants to a magnitude of stresses such as trampling, tugging, pulling, waste excrement and daily defoliation. These continual effects will most likely lead to a rapid decline in stand persistence. There is a strong correlation between winter dormancy and grazing tolerance, but there are also a number of both morphological and physiological traits that contribute to differences in lucerne persistence under grazing.

In the early 1990s, at the University of Georgia (USA), it was identified that lucerne which would have the ability to withstand periods of continuous grazing would be highly desirable. This stemmed from a period of severe droughts which led to a significant decline of many tall fescue and lucerne stands from overgrazing. Early cultivars with increased rhizome and stolon production were initial strategies of breeding grazing varieties, but these types lacked expression in many environments and were associated with low yields and poor persistence due to lack of pest and disease resistance. The development of grazing tolerant cultivars from identification (through ideotype breeding and recurrent selection following continuous stocking by beef cattle) to selection of surviving genotypes with the appropriate traits and characteristics (such as high yield and multiple pest resistance) was described by US researchers (Bouton 2012). A standard test protocol to characterise and screen lucerne cultivars was developed and was included in the NAAIC (North American Alfalfa Improvement Conference). Standard test protocols (Smith & Bouton 1998), where fully replicated trials require continual grazing for a minimum of 120 days through the grazing period. This resulted in the release and commercial success in the United States of ‘Alfagraze’ – the first grazing tolerant lucerne.
A 6 year screening programme was conducted in the United States (California) by Cal/West Seeds, which combined elite breeding lines and successful commercial varieties. These evaluation trials were continuously grazed by both sheep and cattle for lengthy periods with high stocking rates, following the NAAIC standard test protocols developed at the University of Georgia. As a result of this screening programme, 24 lines of the elite grazing tolerant material was sent to Australia and evaluated against 18 of the commercial Australian lucerne standards. Two trials were sown in 1999, one at the Leigh Creek Research Station (Ballarat, south-west Victoria) and the other at Gundagai (southern NSW). After 4 years of rotational grazing, the Leigh Creek trial was subjected to continuous grazing for 2 years with a stocking rate of 40 sheep/ha. Supplementary feed was provided so a high stocking rate could be maintained. The NSW site on the other hand suffered severe drought, therefore final selections from these trials were made with confidence that conditions were as tough as lucerne is likely to encounter. Almost all of the US bred cultivars developed for grazing tolerance persisted better than every Australian standard. Two breeding lines were identified for outstanding persistence, acceptable winter dormancy, strong pest and disease resistance and yields equal to the best standard cultivars and were subsequently released as ‘Stamina® GT5’ and ‘Stamina® GT6’.
The Grazing Tolerance Story (continued)

These experiments, along with other subsequent trials around Australia and other published literature, have clearly shown that through maintaining stand density, improved persistence, quality and yield can be achieved in lucerne cultivars that have been selected for grazing tolerant characteristics. Improved persistence also results from reduced weed invasion of the stands. Further benefits of grazing tolerance (GT) cultivars are portrayed in hay production through continually producing high yields and strong stand density, high quality in maintaining stem density, as well as improved traffic tolerance (another source of stress on the crowns of plants) through hay-making and silage processes.

Producers should be cautious of purchasing cultivars claiming grazing tolerance in the market, which have not been subjected to the standard test protocols under Australian conditions.

If this claim is made, it is strongly recommended that the evidence is provided, and the data scrutinised, to prove that it was run according to industry standard protocols. It also must be further stressed that these trial protocols used in the selection and identification of these elite cultivars are for experimental evaluation purposes and in no way are a recommendation for grazing practices. This is due to the importance of allowing lucerne to replenish its carbohydrate reserves which is critical to long-term stand performance. However, in terms of drought and management difficulties associated with rotational grazing at certain times of the year, lucerne will be over-grazed and the benefits of the grazing tolerant lucernes should be significant.

Important

For true grazing tolerance ensure you choose cultivars that are evaluated under standard test protocol by Smith & Bouton in 1998.
Understanding Dormancy

Selecting the correct lucerne cultivar for your system will go a long way to determining the success of your stand. The first step is to match the dormancy type you require to suit your environment and your production system. Winter activity (also known as winter dormancy or fall dormancy) is basically determined by the amount of regrowth produced in the autumn-winter months following the final harvest of the spring-summer growing season. It is generally measured on a scale 1 to 10, with a dormancy/activity rating of 1 (equal to very winter dormant expressing no winter growth), to 10 (expresses high winter activity with high regrowth potential and classified as highly winter active). This expression of dormancy characteristic is the plant genotypes response to the environment. For example, shortening day lengths and decreasing temperatures will result in the expression of winter dormant cultivars dormancy period.

The dormancy of a lucerne variety and where it is being grown determines the length of the growing season. Lucerne has the ability to grow all year round, with higher growth rates in spring and summer and slower growth rates during the autumn and winter. Lucerne cultivars can vary significantly in their late autumn to winter growth, depending on dormancy classification. This also has a significant influence on what management or requirements a producer has for their lucerne stand.

Highly winter active cultivars are better suited to high yield potential environments, where the winter growth can be successfully utilised. Winter active varieties will stop growing actively later in the autumn and start earlier in the spring than the more dormant cultivars.

Dormant and semi-dormant cultivars generally persist longer than winter-active cultivars, although there are exceptions to this rule.

**Winter dormant (1-3)**
- No autumn or winter growth, suitable to severe cold environments with only a very short growing season. Very prostrate growth habit.

**Semi winter dormant (4-5)**
- Little winter growth but excellent persistence and summer quality for hay and or grazing. Suitable to broad-acre and specialist hay or grazing systems, however, other pasture species may be required for winter feed. Prostrate growth habit with deep set crowns.

**Winter active (6-7)**
- Suited to areas with longer growing seasons. Good density and reasonable persistence provides increased winter feed and an excellent fit for dual-purpose systems. More erect growth habit.

**Highly winter active (8-10)**
- Suited to long season environments and high production of winter growth. Very upright and erect, with narrow crowns and basal buds found higher in the stems. Generally sown for short rotations (2-4 years) and best suited to high quality hay production stands.
**Benefits of Lucerne**

Lucerne is a perennial legume with a taproot that gives the plant access to water and nutrients deep in the soil profile. This gives the plant superior drought tolerance and preference over grasses in lower rainfall areas.

Lucerne is a multi-purpose plant that can be either grazed in situ or conserved as hay/silage to feed during times of the year when pasture quality or diet protein levels are low. Lucerne has excellent stock acceptance and produces impressive yields of high quality feed.

- Suitable for all stock classes i.e. dairy, sheep and beef
- Suitable for ewes during lactation and mating
- Provides high quality feed through dry periods when most other species will typically be losing quality
- Lucerne produces high yields in dryland environments, especially on deeper soils
- Usually sown in pure swards and can be grazed or conserved
- Shows greater drought tolerance than most other pasture species and responds quickly to moisture after drought

### Where to grow lucerne?

Growing lucerne is appropriate for farmers who have:

- Annual rainfall or irrigation greater than 300mm per year
- Rotationally grazed stock
- Preference for nitrogen (N) to be generated by a plant rather than N based fertilisers
- High fertility and free draining soils with a pH over 6.0

### 1. Good Drought Tolerance

- Lucerne is drought tolerant due to its water use efficiency (WUE). WUE is the ratio of total dry matter accumulation to total water input (kgDM/ha/mm of water used)
- Drought tolerance is influenced by soil depth, soil texture, plant species and rooting depth
- Lucerne has a taproot which can extract more available water from the soil profile than some grass species
- WUE is highest in spring
- Species with high herbage nitrogen (N) content have high WUE. Lucerne has a higher herbage N content than most grass/clover pastures and therefore a higher WUE

### 2. Nitrogen Fixation

- Lucerne is a legume that can fix its own nitrogen, (i.e. convert atmospheric nitrogen into plant available nitrogen) reducing the requirement for application of nitrogen fertiliser
- Nitrogen fixation is directly proportional to herbage grown (lucerne produces approximately 25kg N/t of above ground DM/ha)
- Lucerne will fix more N annually than white clover pastures due to higher yield when soil moisture is limiting
- Lucerne does not require nitrogen application once established. Applying N may decrease N fixation and encourage growth of weeds within the stand
3. Longevity

- Typically, lucerne persists for 4-8 years in a pastoral system (stands can persist longer in drier environments where pressure from weeds is low and well controlled)
- Persistence is dependent on grazing management and pest and disease pressure
- Modern cultivars, such as Stamina® GT5 and Stamina® GT6 tolerate diseases, aphids, Sitona Weevil, fungi and viruses better than older cultivars such as Aurora
- Stand renewal is based on a decline in plant population and an invasion of taprooted and rhizomatous weeds, for example dandelion, yarrow and couch/twitch

4. Increased Dry Matter Production

- In a dryland environment, lucerne can produce up to 40% more dry matter than other pasture species
- Lucerne produced the highest annual yield compared with ryegrass/white clover pastures in an eight year dryland experiment at Lincoln University, Canterbury, NZ, Figure 1 (lucerne produced 12.9 t DM/ha compared with 6.6 t DM/ha for ryegrass/white clover pastures in Year 8)

5. Environmental Benefits

Lucerne has the ability to extract rather than leach nitrate i.e. “cleanup” N contaminated sites. This is due to its taproot extracting N at soil depths greater than other pasture species’ root systems. This extraction can be used advantageously in areas near waterways where leaching is potentially an issue or in areas that receive high applications of nitrogen such as dairy effluent areas. This benefit is not currently captured well but is an option to incorporate into farming systems.

Source: Prof. Derrick Moot

Lincoln University trial – comparative dry matter yields

Figure 1

Growing - How to

Planning

- Select the best paddocks which are free draining
- Lucerne will grow on a range of soils, from deep sands to heavy clays. It seems to perform best on deep sandy loams, alluvial soils, red basaltic soil, red volcanic soil and alluvial flats. It can also be grown on heavier clay soils if infiltration and drainage are adequate and no hard clay pans are present. Good natural slopes or higher elevation are generally recommended. Remember, soil drainage is not always the best indicator, as subsoil may be prone to waterlogging (i.e. hilly Ordovician country)
- Understanding the limitations of lucerne is important: factors such as low pH, Aluminium and heavy soils prone to waterlogging or poor drainage are areas to be avoided
- Check drainage in flood irrigation bays – well-levelled bays with no hollows are required; at least a 1:800 slope, and able to irrigate and drain quickly to avoid lucerne scorch
- Plan your crop 12 months to 2 years prior – remove as many weeds as possible during this phase - if high weed burden, a cereal crop or brassica clean-up crop will help prior to sowing. Also consider weed control options in years prior such as spray-topping, spray-grazing and winter-cleaning, depending on the particular weed families you are trying to control
- Soil test 0-10cm and 10-60cm for pH, Electrical Conductivity (EC), Aluminium (Al), Phosphorus (P), Potassium (K) and Sulphur (S) levels and correct as necessary (talk to your local agronomist). Apply lime if pH is low. Don’t forget Molybdenum

Introduction
Depending on prevailing conditions and location, sowing can occur in late-winter/early-spring. This allows plants to establish in increasing soil temperatures and allows for good winter weed control prior to sowing. Autumn sowing can also be successful, but only if there has been good control of winter weeds prior. Autumn sowings reduce the risk of a failed spring sowing with a much greater likelihood of rain. This is more suited to winter-active or highly winter-active cultivars. Sow when the average soil temperature is above 8°C in late-winter to early-spring and 14°C in autumn. Sowing rates are rainfall and environment dependent – please consult your PGG Wrightson Seeds Sales Agronomist for sowing advice. Ensure good seed to soil contact during the sowing process. This will aid strong, even germination. Ensure lucerne seed is inoculated with the correct strain of rhizobium (AL) – this will allow for the development of nodules to fix atmospheric nitrogen and for successful crop productivity and viability. Allow the lucerne to reach a minimum of 50% flowering (50% of the tallest stems have a flower) prior to the first grazing/cutting. If the stand is weedy at establishment it can be grazed/cut WHEN it is 15-20cm tall and then left to flower a minimum of 50%. If irrigation is available, apply water before sowing to ensure adequate soil moisture at the time of sowing.

**NOTE:** For established stands, delay irrigation until 10-14 days after grazing

<table>
<thead>
<tr>
<th>Irrigation encourages weed seed germination</th>
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<tbody>
<tr>
<td>When lucerne has been grazed or cut (i.e. its leaves removed) the crop requires minimal water to regenerate leaf cover</td>
</tr>
<tr>
<td>Waterlogging can cause roots to rot</td>
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</tbody>
</table>

Weeds need to be controlled as they take moisture and nutrients away from the stand. There are a range of effective herbicides available for weed control in establishing lucerne stands – consult your local agronomist for recommendations.

**Lucerne trial**
Leigh Creek, Victoria
Same cultivar - inoculated lucerne (left) looking strong, green and healthy next to an un-inoculated lucerne (right) looking pale and weak.
**Growing - How to (continued)**

### Established Stand Management

#### WEED CONTROL

- Identify weeds present
- Always spray in winter for winter-cleaning weed control (i.e. when the lucerne is dormant)

*Dryland lucerne stands should be sprayed every second year (at least)*

*Irrigated lucerne stands should be sprayed annually*

- Consult your local agronomist for chemical recommendations

#### FERTILISER

- Soil test annually to ensure fertility is maintained and appropriate fertiliser is used
- Leaf analysis during active spring growth can also be used in conjunction with soil tests to check soil fertility and fertiliser type
- Apply the recommended lucerne fertiliser after the first cut in spring and then after every second cut, in a cut and carry system
- Grazed lucerne requires less fertiliser than hay cutting because nutrients are returned through dung and urine

### Pests and Diseases

- Identify early and graze or cut the stand (removing the pest feed source)
- If pest infestations are high and are causing damage to yield, then using an insecticide is necessary
- Early winter graze to reduce over-wintering aphid populations
- There are numerous Fleas (i.e. Lucerne Flea), Mites (i.e. Red Legged Earth Mite), Grubs, Weevils and Aphids that attack establishing lucerne stands. Monitor early (both beneficial and predators) to prevent rapid population build-up and damage – contact your local agronomist on control options

#### IRRIGATION

- If irrigation is available, this can help when moisture is low. Although lucerne is highly drought tolerant, irrigation increases the potential to more than double the lucerne yield in dry years

*NOTE:* Weed invasion can occur when irrigated too frequently and immediately after cutting or grazing

- The optimum frequency and timing of irrigation is dependent on how much water the soil can hold, or your soils' holding capability
- When demand for water is low, delay irrigation until new leaves are visible and are ready to expand and out-compete germinating weeds
- Roots grow at 1cm/day. Growth above the ground stops while reserves are put into the roots
Grazing Management – How to

For long term productivity and persistence of lucerne stands, best practice management is to rotational graze with a minimum period of at least 35 days recovery. This spell period is critical as lucerne relies on stored energy in its roots to regrow. The lucerne plant won’t start putting energy for storage back into growth until after 15-20 days following a defoliation through cutting or grazing. Actual grazing duration should be targeted between 5-7 days until all green leaf and soft stem is removed. If the grazing period is too short, the crop will not be adequately utilised and wastage occurs. If the grazing period is too long, sheep for example, will actively graze new crown shoots once they have reached a grazeable height.

Remove remaining stubble and stems after grazing if stock pressure is low or uneaten. This allows better utilisation on next grazing or cuttings.

Different strategies and focus should be applied to lucerne stands in different seasons and climates. This includes shortening rotations to maximise yield and animal performance in spring and summer, while in autumn allowing approximately 50% flowering for root reserves to replenish for survival over winter for early spring production.

Spring

The focus for spring grazing is on stock performance, maximising live weight gains and yield.

A fundamental, yet unavoidable, reality of lucerne production is that the yield and quality are inversely related. This means that as yield increases, the quality of the stand generally declines and is often referred to as the “yield-quality trade-off”.

The timing of the grazing or harvest is a compromise between yield, quality and persistence. Grazing adds another level of complexity to this due to animal performance and health factors. Researchers have proposed a relative forage yield and quality summary diagram (figure 2) showing the different stages of lucerne with different yield components and digestibility. As the yield of the crop increases through stages of maturity (vegetative to post-flower), stems make up the greater proportion of total yield and the digestibility of the stem material declines because of increased lignin content. The leaf yield contributes little to the total yield beyond the first flowering stage.

| Relative yield/quality trade-off | Figure 2 |

**Grazing Management – How to (continued)**

**Spring (continued)**

Basic principles in Figure 2 (pg15) can relate directly to dryland lucerne grazing management. If rotation lengths are shortened and grazing occurs too early in the vegetative state, it may reduce the replenishment of root carbohydrates and affect regrowth and persistence. It has been well documented that frequent early grazings can reduce root size and stem height (Moot et al. 2003). Even though it is high quality feed, grazing immature and actively growing, ‘lush’ foliage can result in animal health issues. Grazing in the later stages of maturity can result in less digestible and nutritious feed and, in turn, result in poor animal performance. This is often observed through a high proportion of remnant stem, resulting in animals lacking adequate nutrition and losing condition. In addition, extended grazing periods may result in new shoots from crown buds being grazed-off, or allows the regrowth of shoots to become more accessible to grazing animals that are high in protein and subsequently eaten by livestock leading to animal health issues.

**Summer**

Summer grazing period should focus on utilising the crop yield to maximise animal productivity.

- Short rotation – period dependent on location
- Water stress accelerates flowering but leaf is still high quality
- Conserve a true surplus if the opportunity presents (i.e. there is more lucerne available than stock demand)

The most limiting factor for dry matter yield through this period is directly related to the availability of moisture. The onset of drought conditions, or prolonged moisture stress periods during summer, has a number of implications which include reduction of dry matter production, reduced transpiration which can increase sward temperatures, accelerated phonological development and senescence and reduced quality. Drought-stressed crops can still accumulate nodes on basal buds after hard grazing during summer which will allow for a rapid response after rainfall. Therefore, spelling is critical following a grazing so that stock are removed to protect developing lucerne buds.
Autumn

The autumn time is a critical period in the physiological process of lucerne growth. The objectives through this period should be to focus on managing the stand for persistence and production in the subsequent year rather than focus on animal performance.

- Longer grazing rotations – period dependent on location
- Allow a minimum of 50% of the tallest lucerne stems to have an open flower at least once, from mid-summer to autumn, to allow root reserves to recharge before grazing
- Graze if drought is ‘terminal’ i.e. plants stop growing to avoid loss of leaves, then allow recovery to at least 20cm height after rain
- Red Legged Earth Mite, Lucerne Flea and Aphids can be an issue. Ensure monitoring and if population is causing damage, a chemical application may be needed. Consult your local agronomist for chemical recommendations
- Shorter day length and decreasing temperatures signal the plant to start directing energy to root reserves for stand persistence and production next spring
- Ewes can be flushed on lucerne, however, if Leaf Spot is present then oestrogen levels may be affected

Winter

If sowing a winter-active lucerne, grazing rotations should be lengthened.

- Spray weeds before lucerne leaves grow back to minimise crop damage
- Resist the urge to graze regrowth after the first winter grazing, as this delays spring growth/first grazing and reduces yield
- The order in which paddocks are ‘hard grazed’ and then winter-cleaned dictates the order they will be ready for grazing in spring
- Application of a winter-clean too late in the dormancy period can damage the developing buds on the lucerne regrowth
- Late winter grazing or continuous stocking through this period can remove the growing points from the stems and can reduce final yield by up to 25% (Moot et al. 2003)
Cutting - How to

Timing

There are various techniques to assess when lucerne is ready to cut. Many other factors must also be taken into account, including the location you are in (i.e. southern QLD versus Tasmania) which will determine the rotation length between cuts in different seasons, the dormancy class you are growing and of course, the prevailing weather conditions! Plant growth stage can be a very accurate predictor of cutting time. Crown shoots are an excellent guide for determining cutting time, as flowering is controlled by day length and different dormancy classes and varieties may produce new crown shoots before buds or flowers appear in spring or autumn. Targeting the new crown shoot regrowth when it averages around 2cm is considered optimum.

The “yield quality trade-off” again is critical when determining the optimum time of cutting:

- Cutting at the full-flower stage can reduce quality significantly, as well as negatively impacting subsequent hay yields.
- Cutting height should be as low as possible without damaging the crowns or new shoots. It is important however that enough stubble is left to ensure the plant-material is off the ground for aeration and to stop ground moisture moving up into the windrows. It is suggested that 7-10cm is ideal (see Figure 3 below).

Cutting at the vegetative and pre-flower stage can produce high quality hay but yields may be reduced than if it had been left longer. Frequent cutting at this stage can deplete root reserves and stand density may decline.

- Cutting at the early bud stage yields more and still can produce excellent quality hay. If cutting is frequent at this stage, it is suggested to allow the stand to mature past the early bud stage occasionally to extend stand life.

- Cutting at the traditional 10% is a good compromise between quality, yield and stand persistence. Although, generally by this time, even though yield may be optimised, quality is already in decline.

Cut lucerne when new crown shoots are at least 2cm long but below mower height (7cm in this example) to ensure persistence.

Source: Producing Quality Lucerne Hay, M Lattimore, NSW DPI (2008)
Making good quality lucerne hay is a skill that requires experience or good advice from experienced people, a good environment, good organisation, motivation, commitment and dedication with good reliable equipment.

Stamina® GT6 harvested for premium hay market: Smeaton, Victoria

**Fertiliser Maintenance**

- Based on nutrient removal, lucerne should be fertilised to maintain its nutrient requirements. Nutrients that are removed per tonne as hay:

  - **Phosphorous (P):** 2–3kg
  - **Potassium (K):** 15–20kg
  - **Calcium (Ca):** 13–17kg
  - **Sulphur (S):** 2–4kg

- Maintain visual observations of stand health and if unsure take follow-up plant tissue tests to identify problems, particularly for micronutrient status such as Boron and Molybdenum.
Premium Lucerne Haymaking

Lucerne hay remains the premium hay of choice for the discerning livestock owner. To meet market demands, focus on producing hay that meets the following criteria:

**CLEAN STAND**

- Weeds reduce the aesthetic appeal and palatability of the bales and/or may put livestock at risk of toxicities. Consult your local agronomist about keeping your stand clean.

**CONTROL INSECTS**

- Insects have the potential to severely damage lucerne and therefore reduce the yield and quality of the hay. Consult your local agronomist about an insect control programme.

**MORE LEAF, LESS STEM**

- Protein and other valuable nutrients are concentrated in the leaf.
- Leafy lucerne hay is more readily accepted by livestock. Leaf yield can be maximised through shorter intervals between harvest, by harvesting with less flower and by not drying the crop down too far. Avoid excessive raking (i.e. spreading or turning of the cut lucerne for drying) before baling.
- Select varieties with better leaf holding ability.

**GREEN COLOURATION**

- Although colour isn’t always linked with nutritional value, the market prefers greener bales. Greenness is improved by baling more leaf and less stem, by avoiding bleaching from rain or heavy dew and by shed-storing bales well to prevent rain or sun bleaching damage. Avoid mould growth by reaching the target moisture content at harvest.

**KEEP DUSTY BALES TO A MINIMUM**

- Don’t harvest the hay too dry or on dusty hot days when topsoil may end up in bales. Horses are more prone to respiratory problems than sheep or cattle from dusty hay.

**TARGET BALE MOISTURE CONTENT**

- Targets differ with bale size. Reasonably dry implies more dust. Too damp increases the risk of spoilage, mould growth and overheating of stored bales.

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**Target moisture content for lucerne hay bales**

<table>
<thead>
<tr>
<th>Bale size and type</th>
<th>Hay moisture content (%)</th>
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</thead>
<tbody>
<tr>
<td>Small square</td>
<td>18-20</td>
</tr>
<tr>
<td>Medium square/Large Round</td>
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<tr>
<td>Large square</td>
<td>12-14</td>
</tr>
<tr>
<td>Export hay</td>
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</tbody>
</table>

**CONDITIONING**

- Rolling and crimping stems improves the drydown speed of stems (so leaves don’t become dry) and produces a softer hay that is more accepted by livestock.

**SMALL BALES**

- Smaller bales are easily marketed due to ease of handling, transportation and storage compared with rounds or medium squares.

**FEED TEST BALES**

- Core a line of bales and get the samples analysed. Offering feed test results to purchasers shows that you are committed to producing top quality hay.

---

Source: Prof. Derrick Moot
**Animal Health Management**

### Ruminal Bloat

**WHAT IS IT?**
- High quality leaf proteins fermenting rapidly in the rumen, forming a stable foam that prevents stock from belching gas.

**PREVENTATIVE MEASURES**
- Don't allow hungry stock sudden unrestricted access to lucerne.
- Offer hay or straw to reduce appetite and to help break down rumen foam.
- Introduce stock later in the day when dew or frost is off the lucerne.
- Slow the grazing rotation, allowing lucerne to become more fibrous.
- Add bloat oil to stock drinking water or as bloat blocks.
- Rumensin as anti-bloat capsules, or as Rumensin Trough Treatment.
- Mowing and wilting lucerne in front of cattle.

### Thiamine Deficiency

**WHAT IS IT?**
- Changes to the types of rumen microbes that break down thiamine caused by sudden change in diet.

**PREVENTATIVE MEASURES**
- Gradually adapt stock from poor quality forages to lucerne.
- Provide extra fibre through hay or straw.
- Slow the grazing rotation, allowing lucerne to become more fibrous.
- Thiamine injections for stock before they go onto lucerne may help (consult your veterinarian).

### Red Gut in Sheep

**WHAT IS IT?**
- High quality lucerne leaving the rumen too quickly, passing to the intestines and continuing to ferment, forming gas and causing the intestines to twist.

**PREVENTATIVE MEASURES**
- Offer hay or straw to slow the passage of feed from the rumen and to increase the volume of the rumen (less room for the intestines to twist).
- Allow access to poorer quality pasture or hay for seven days first.

### Enterotoxaemia (Pulpy Kidney)

**WHAT IS IT?**
- High quality lucerne passing to the intestines where it encourages rapid growth of Clostridia that produce toxins.

**PREVENTATIVE MEASURES**
- Vaccination of stock with a Clostridial vaccine, with the second (booster) shot administered 10-14 days before stock start grazing lucerne.
Infertility in Ewes

WHAT IS IT?
- A reduction in ovulation rates caused by feeding lucerne before or during joining/mating. Lucerne stressed by insect attack or foliar disease may produce coumestrol, the compound that reduces ovulation.

PREVENTATIVE MEASURES
- Healthy, normal lucerne plants should not produce coumestrol. If in doubt, do not graze ewes on lucerne or feed lucerne hay or silage before or during joining/mating.

Sodium Deficiency

WHAT IS IT?
- Low sodium levels for the animal because the lucerne is “natrophobic” and does not accumulate sodium in the green part of the plant.

PREVENTATIVE MEASURES
- Supplementation of stock with sodium as salt blocks or salt licks.

Metabolic Disease

WHAT IS IT?
- High concentrations of potassium and/or calcium in lucerne which increases the risk of hypocalcaemia in dairy cattle before and after calving.

PREVENTATIVE MEASURES
- Don’t feed lucerne hay or silage to springing dairy cows before calving.

Source: Prof. Derrick Moot
**Mixed Swards**

If you have never grown lucerne before, plant a pure stand of lucerne and learn how to manage it.

After the ideal areas of your farm for lucerne monocultures are established, there may be an option to look at lucerne/grass mixes on more difficult soils or topography. These range from lucerne with some grass to minimise soil erosion on wind prone sites, through to a grass pasture where lucerne is providing the legume component where other legumes (e.g. white clover) have failed. The management of lucerne/grass mixes is more complex and extra caution should be taken.

Research has shown that increasing distribution of feed over longer periods can be achieved by using companion species with different seasonal growth patterns. Examples of companion species with lucerne include:

- Phalaris
- Chicory
- Cocksfoot
- Tall fescue
- Plantain
- Subterranean clover
- Prairie grass
- Oversowing annual ryegrass, oats or forage ryecorn
- Undersowing with winter cereal crops

There are many positives and negatives associated with sowing a companion species – such as mitigating the potential animal health issues, but conversely reducing quality hay and herbicide control options. Consult your local agronomist on the best species or sowing practices suited to your farming systems.

**Autotoxicity**

It is well known that lucerne plants can produce chemical(s) which suppress the germination and growth of lucerne seedlings. This phenomenon is called autotoxicity.

Autotoxicity is difficult to detect and predict, as soil type, rainfall, management, age of the previous stand etc. all play different roles. Older lucerne stands are more prone to it than young stands because of the accumulation of the chemicals - in evolutionary terms the plant is trying to stop its seedlings growing where it already is.

For a thinning older stand, over sow Italian ryegrass (or similar) in autumn to get use out of the accumulated nitrogen and prolong the stand life. Alternatively, drill in a perennial grass and make it a pasture that might last another 3-4 years as your transition paddock.

**REFERENCES AND FURTHER READING:**
USES:

**The ultimate choice for grazing tolerant lucerne**

Stamina® GT5 is a breakthrough in the development of grazing tolerant lucernes for the Australian environment. It is a true grazing tolerant lucerne which has been trialled over many years under the internationally recognised Standard Test Protocol for grazing tolerant lucernes (see page 6 for more information). It has low, broad crowns and is naturally of high forage quality with fine stems and high leaf-to-stem ratio. Stamina GT5 lucerne is the ultimate choice where a stand is required for prolonged periods of set-stocking.

- Ultra persistent under grazing
- A semi-dormant grazing tolerant lucerne
- Tolerates prolonged periods of set-stocking
- Produces excellent quality hay
- Has good overall resistance to most lucerne diseases

**Sowing rate:** 5-25kg/ha

**Rainfall / Irrigation:** 350mm pa
**Trial Analysis**

**2006-2010 grazing tolerant lucerne trial, Leigh Creek, VIC**  
![Figure 4](image)

7 April 2010  
LSD5 = 14.5  
CV% = 15.2

**2006-2010 grazing tolerant lucerne trial, Leigh Creek, VIC**  
![Figure 5](image)

8 September 2010  
LSD5 = 15.5  
CV% = 25.9

Figure 4 shows the results after a 5 month period of continuous grazing (first assessed on the 7th of April 2010).

Figure 5 shows the same trial after another 6 months of only limited grazing (assessed on the 8th September 2010). It shows further decline in stand persistence of the non-grazing tolerant types and the ability of Stamina GT5 to tolerate extended periods of less than ideal grazing management. Most Australian farmers understand the need for appropriate spells to enable lucerne to replenish carbohydrate reserves. In times of drought however, lucerne will be overgrazed and the benefits of grazing tolerant lucerne types, such as Stamina GT5, should be significant.

**Disease and pest resistance**  
![Figure 6](image)

<table>
<thead>
<tr>
<th>Pest / Disease</th>
<th>Resistance</th>
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<tbody>
<tr>
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<td>Bacterial Wilt</td>
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<tr>
<td>Moderate Resistance</td>
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<tr>
<td>Low Resistance</td>
<td>6-14%</td>
</tr>
<tr>
<td>Susceptible</td>
<td>0-5%</td>
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</table>
**Trial Analysis (continued)**

**2008-2013 Grazing tolerant lucerne trial, Leigh Creek, VIC**  

![Figure 7](image)

Ground cover of lucerne varieties categorised by dormancy group. This trial was continuously grazed for six months, at 50 sheep/ha equivalent, from November 2012 through until May 2013. The final ground cover percentage was measured on the 5th of November 2013. This trial was conducted following the internationally recognised Standard Test Protocol for grazing tolerance.

**2011-2016 Grazing tolerant lucerne trial, Leigh Creek, VIC**  

![Figure 8](image)

Ground cover of Stamina GT5 up against a variety of products available in the market place across a range of dormancy groups. This trial was continuously grazed for six months at 50 sheep/ha equivalent from December 2014 through to June 2015. The final ground cover percentage was measured on the 21st of February 2016, the following year after recovery. This trial was conducted following the internationally recognised Standard Test Protocol for grazing tolerance.
**Stamina® GT5 lucerne a stand-out performer for grazing tolerance**

**BACKGROUND**
Prime lamb producers Steve and Genevieve Affleck turned to Stamina GT5 lucerne in 2012 looking for improved pasture growth and a way to span the feed gap when grasses were in short supply.

The husband and wife team run a first cross ewe enterprise with some composites. Running two lambing seasons in autumn and spring annually meant they needed consistent feed throughout the year.

Steve Affleck says what started as “just an experiment” across five hectares of his property in Wombat, in southwest NSW, has genuinely paid off.

“Up here like most of NSW, once the real summer bites a lot of your grasses are just useless. The persistence of the Stamina GT5 lucerne at that time of the year comes into its own,” he says.

“It’s got its roots right down low and it just keeps growing right into and past Christmas. We were still grazing it in May.

“I said at the time, I wanted something that was persistent and tolerant to heavy grazing and Stamina GT5 lucerne has certainly delivered that.”

**CHALLENGES**
It hasn’t always been this way. While located on extremely good country, Steve says when he purchased the property in 2012, it had obviously been neglected for some time.

Keen to run a high stocking rate, Steve needed a way to improve the pastures for persistency and a high tolerance to grazing.

Steve also needed to overcome the dry summers and wet winters in the region calling them his “biggest issue for pasture management.”

“In the heat grasses and clovers would run out and we needed a pasture that would come in at this time - particularly at the time of joining ewes,” he says.

Steve also wanted a feed that could finish his lambs well to maximise their growth and weight potential.

**SOLUTION**
Working with his local agronomist, Steve decided to trial Stamina GT5 lucerne from PGG Wrightson Seeds.

Stamina GT5 has emerged from a long screening process both locally and in the USA and has been proven to deliver outstanding persistence, acceptable winter dormancy, strong pest and disease resistance, and yields equal to the best standard cultivars.

These evaluation trials were continuously grazed by both sheep and cattle for lengthy periods with high stocking rates, following the NAAIC (North American Alfalfa Improvement Conference) standard test protocol developed at the University of Georgia.

With this in mind, Steve trialled dual pasture options on his property.

The first - a pure lucerne stand trial that comprised 5ha of Stamina GT5 lucerne sown in autumn 2012. This was sown at 12kg/ha and was primarily for finishing lambs. Another 10ha was sown in 2015, and a further 15ha in 2016.

The second – a pasture mix incorporating Stamina GT5 lucerne (3kg/ha), sub slover (2kg/ha), tall fescue (3kg/ha) and phalaris (2kg/ha). Steve sowed 10ha in 2015, primarily for his joined ewes and to provide high quality feed during lambing.

Both pastures were sown using a small air-seeder with a five-inch spacing to keep his plant population dense per square metre, and to have a high level of ground cover.

“It’s only a very small spacing but the resulting ground coverage is exceptional,” he says.
RESUL TS

Steve is thrilled about Stamina GT5’s impact on his feed availability and sheep performance, saying the lucerne has “just come into its own and flourished” on his property.

He says Stamina GT5 lucerne has been great as a way to bridge the gap in feed when other grasses and clovers are not available.

“We are lucky if we give the stand two weeks’ rest between grazing. It’s still really thick and dense. We wouldn’t have lost more than 2% coverage even after years of hard grazing” Steve adds.

In addition, Steve says that there have been no issues with pests in the pure Stamina GT5 lucerne stand, it has provided him flexibility in feed management, and it has ability to bounce back after heavy stock traffic.

He points to the remarkable effect at one of the gateways into the Stamina GT5 lucerne stand.

“It gets constantly hounded by sheep walking all over it through gateways. After it had been locked up for a couple of weeks, the plants all came back quickly.”

Steve’s also upbeat about hay harvested from the Stamina GT5 lucerne.

With his last cut he averaged nine five-foot-round bales/ha, and describes the quality of the hay as excellent.

“We had just sold the lambs and thought, we’ll lock it up and see what it does. After some timely rain it took off and we decided to cut it for hay. The sheep eat the lot, so it’s beautiful hay, it really is, and it retains its leaf really well”, he says.

“It’s really thick and really dense. We had a hell of a time trying to get it dry, it is basically all leaf”.

The sheep performance is another area that has witnessed great results.

He says on the Sha of pure Stamina GT5 lucerne stand, he turned off more than 400 lambs while the same area carried up to 20 lambs/ha at any one time.

He adds that his lambs gained an extra 2kg of weight and turned off two weeks earlier than lambs he was finishing on oats.

“We found that finishing on the Stamina GT5 lucerne actually gets a better quality lamb quicker than having them on grazing oats,” Steve notes.

“That’s why we’re pushing now to put so much Stamina GT5 lucerne in, because it just gives us that flexibility with a quality feed, and the sheep perform well on it.”

The Stamina GT5 pasture-grasses mix has also performed well, with Steve acknowledging the ewes and new lambs have also had first-rate results.

He says the ewes were joined on it and then lambed on it as well.

“With the lambs at two and a half months old the pasture was still hanging in there,” he says.

“When I inspected the lucerne it was getting eaten down a bit, but there was still plenty of feed in the paddock. Considering we had 7 ewes and up to 10 lambs per hectare.”

CONCLUSION

Steve describes his experience with Stamina GT5 lucerne as excellent and says he has no hesitation recommending it to other sheep producers as a highly grazing tolerant lucerne.

“I absolutely would, yes.”

Steve and Genevieve Affleck
Wombat, NSW

For more information on how Stamina® GT5 grazing tolerant lucerne can improve your farm grazing productivity and profitability contact your local PGG Wrightson Seeds Sales Agronomist as listed at www.springpasture.com.au.
USES:
The first grazing tolerant lucerne for the Australian market

Stamina® GT6 combines useful winter growth, great persistence and the ability to tolerate set stocking of sheep. It provides excellent yield and quality during warmer growing months. Stamina GT6 was the first lucerne released for Australian farmers trialled under the internationally recognised Standard Test Protocol for grazing tolerant lucernes.

- A grazing tolerant lucerne that is semi-dormant
- Selected from long term Australian lucerne grazing trials

Sowing rate: 5-25kg/ha

Rainfall / Irrigation: 350mm pa
**Trial Analysis**

*2003 sown lucerne trial, Bendigo, VIC*

Figure 9 shows the final ground cover percentages (left axis), measured 24-April-2004 following 4 years of continuous grazing relative to the actual winter activity rating of the variety (right axis).

**Disease and pest resistance**

<table>
<thead>
<tr>
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<th>Key</th>
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<tbody>
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<td>Susceptible 0-5%</td>
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</table>

“We first planted Stamina GT6 in the spring of 2008 and that stand is still productive today. We take silage off it early in the spring and then we direct graze it for the rest of the year and we’ve found Stamina GT6 to be extremely productive, providing us with feed when the ryegrasses are less productive due to seasonal conditions.”

**Mark Billing**

**Victoria**
Haymaster® 7

USES:

Ideal option for premium lucerne hay production

Haymaster® 7 is a premium quality, winter-active (7) lucerne with a dense, upright and dark green leafy growth habit. Haymaster 7 provides significant advantages in yield, quality, insect and pest resistance. It has fine stems and low stem fibre for highly digestible hay, fast regrowth and long stand life.

An ideal choice for growers seeking a winter-active, premium hay lucerne, which is also suitable for grazing. It combines exceptional forage quality, yield and persistence.

- High leaf-to-stem ratio with excellent lateral branching
- High yielding winter-active lucerne
- Suited to dryland and irrigated systems

Sowing rate: 8-25kg/ha
Rainfall / Irrigation: 450mm pa
Breeding

Haymaster 7 was selected from elite test lines trialled in Australia. It is capable of auxiliary branching and has great visual appeal with its dark green, leafy and fine stemmed qualities. Haymaster 7 retains its leaf and colour during bailing and has a high leaf-to-stem ratio for improved quality that translates into outstanding animal performance.

Trial Analysis

This trial was located just north of Mudgee, NSW, and was spring sown in 2009. The aim of this trial was to evaluate the performance of new winter active material under prime hay management conditions against a range of commercial standards, with particular emphasis on dry matter yield under irrigation. Haymaster 7 had only recently been commercially released and was the highest yielding dormancy 7 cultivar. Figure 11 shows it was significantly better than older traditional cultivars, such as Aurora, for both seasonal and total yield.
Trial Analysis (continued)

Disease and pest resistance

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</tr>
<tr>
<td>Bacterial Wilt</td>
<td>Resistant</td>
<td>Susceptible</td>
</tr>
</tbody>
</table>

Key:
- Highly Resistant: >51%
- Resistant: 31-50%
- Moderate Resistance: 15-30%
- Low Resistance: 6-14%
- Susceptible: 0-5%

Multi-year, single site dry matter lucerne trial of winter-active varieties.
Sown 2008 and 2011 Ballarat, VIC

Seasonalised dry matter production of Haymaster 7 up against other varieties in the market, collected over three years.
Lucerne hay production makes up the bulk of Wade Jordan’s business in northern New South Wales, where he supplies the horse and dairy industries from his property ‘Riverdale’.

The Nemingha (Tamworth) farmers’ expertise in this area means he is more than familiar with what makes a good lucerne hay.

“We like to see good disease tolerance in lucerne hay, as well as a fast growth rate and good yields,” he says.

2016 was the first season the Jordans have grown a PGG Wrightson Seeds variety, with the decision coming about after they hosted trials for the company.

“After talking to PGG Wrightson Seeds agronomist Jonathon Tink, we decided we would try some of their varieties, and Haymaster 9 is the latest one they had released,” Mr Jordan explains.

“We planted 28 hectares in April 2016 and it was pretty much everything they told us it would be, we were very impressed with it.”

While conditions at the time of planting were dry, being an irrigation farm the Jordans were able to keep water up to the crop.

“Haymaster 9 handled the season exceptionally well, even when we got to those days where it was in the mid-40 degrees, it seemed to hang on and yield a lot better than some of the other lucernes we had,” he says.

“This variety is very leafy and very green, it keeps its colour a lot better than the other varieties we’ve sown in the past.

“Haymaster 9 was also a very quick lucerne to grow again after a cut, a lot better than some of the other varieties we grow here.”

Mr Jordan says there was about a 28-day turnaround from one cut to the next for the Haymaster 9, with the first of six cuts taking place in early October 2016.

“That first cut produced 125 small square bales per hectare, the second cut increased to 170 bales per hectare, and then we had a number of subsequent cuts over 180 bales per hectare,” he recalls.

“We were very surprised by the performance, our district average for lucerne hay is about 125 bales per hectare, while our Haymaster 9 this year averaged around 175 bales per hectare – that extra yield is quite significant.”

“In terms of just our operation, Haymaster 9 out yielded most of the other varieties we grow by nearly 40 bales per hectare, so it was quite a substantial increase.”

With the last cut of his Haymaster 9 taking place in May 2017, Mr Jordan is already planning for the variety’s future.

“We’re actually about to plant another 28 hectares of Haymaster 9 in the next month, as it’s proven itself in our rotation from this first experience, it worked very well for us.”
**USES:**

Highly winter active for premium lucerne hay production

Haymaster® 9 is a new lucerne to the Australian market. It is a great option for producers looking for a premium quality, highly winter active lucerne for hay and/or grazing. With the new salt tolerant trait, Haymaster 9 demonstrates increased germination and yield performance in marginally saline soils.

Haymaster 9 was developed by crossing elite high yielding plants that have the ability to germinate and produce forage under saline stress conditions. Haymaster 9 is also an excellent performing variety in non-saline conditions and was selected for high levels of tolerance to the major lucerne pests and diseases.

- Bred and selected for increased salt tolerance
- High yield potential
- Excellent persistence
- Suited to dryland and irrigated systems

**Sowing rate:** 8-25 kg/ha

**Rainfall / Irrigation:** 350mm p/a
Figure 14 shows the key measurements of Haymaster 9 compared with other highly winter active lucernes. This trial was a Stage 1 trial and was conducted at Gatton and sown in 2011. The graph has been hundredised against Sequel for the 3 categories that were measured.

Image 1 demonstrates the increased germination of Haymaster 9 (left) compared with a conventional highly winter active lucerne (right) in a saline solution where the EC equalled 20. This is considered too high for conventional lucerne seed to be able to satisfactorily germinate, but the Haymaster 9 has germinated evenly and strongly.
Seed Treatment

Applying a seed treatment to forage seed is a very effective plant protection tool, helping to ensure seedling establishment and early plant development is maximised so that a high producing pasture or sward can be achieved.

The first four to six weeks after sowing is a critical stage in the life of a new plant as seedlings emerge and develop their plant structures. Seed treatment has a very important role to play during this period because it is during this time that seedlings are most at risk from external factors such as pest and disease pressure.

Superstrike™ contains a combination of seed protection and enhancement additives within its seed treatment.

Benefits

- Assists in maximising seedling establishment and plant development
- Effective against a range of common insect pests and diseases
- Not harmful to beneficials such as earthworms
- Cost effective compared with ‘broadacre’ control options

Legumes

Recommended for

- Use in all sub-surface and broadcast sowings in both cultivated and nil tillage situations

Contains

- Poncho® Plus, a systemic insecticide for protection against Red Legged Earth Mite, Blue Oat Mite, Cutworm and Lucerne Flea (suppression only). Please note, in some cases where high numbers of pests are present, a follow up insecticide treatment may be necessary
- Metalaxyl-M fungicide effective against the ‘damping off’ diseases *Pythium and Fusarium*
- Inoculated with nitrogen-fixing bacteria (rhizobia)
- A fine lime base for localised pH correction around seedlings
- Grazing withholding period 8 weeks
Pests

Lucerne Flea  Aphids  Red Legged Earth Mite
Cutworm  White Fringed Weevil  Wingless Grasshopper
Heliothis  Sitona Weevil

Diseases

Phytophthora Root Rot  Pepper Spot  Damping Off

Photos supplied by Novachem, AgResearch and DAF QLD.
Supporting you in more ways

For more information on our products or for some friendly advice please contact us using the details below. Let’s grow together.

### Your Customer Service Team

<table>
<thead>
<tr>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>1800 619 910 (8.30am to 5pm EST)</td>
<td>pggwrightsonseeds.com.au</td>
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### Website

- pggwrightsonseeds.com.au

### Sales Agronomists

#### Southern Regional Sales Team

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Role</th>
<th>Phone</th>
<th>Email</th>
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<tbody>
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<td><a href="mailto:egoodall@pggwrightsonseeds.com.au">egoodall@pggwrightsonseeds.com.au</a></td>
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#### Northern Regional Sales Team

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<tr>
<td>Barry Varcoe</td>
<td>South Australia, Southern QLD, &amp; Northern Rivers, NSW</td>
<td>Sales Manager - Northern Region</td>
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<td><a href="mailto:bvarcoe@pggwrightsonseeds.com.au">bvarcoe@pggwrightsonseeds.com.au</a></td>
</tr>
<tr>
<td>Jonathon Tink</td>
<td>Central New South Wales</td>
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<td>0418 329 243</td>
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### Product Development

<table>
<thead>
<tr>
<th>Name</th>
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<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
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### Head Office

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<thead>
<tr>
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