"We average about 1,000 small bales per cut"

Q31 delivers big cuts and big yields for SA farmer David Barker

The quiet achiever

For decades, ML99 has remained one of Australia's top performing lucerne varieties

More than just good looks

Consistently high-quality L56 wins 'Best Visual Appearance Score' award
As the 2019 season begins, now is the time to take advantage of our years of breeding and genetics knowledge to fast-track your productivity.
At Pasture Genetics we are so confident in our seed genetics and the quality of our proprietary products, we will replace seed at half the original purchase price if it fails to establish satisfactorily.

Unfortunately establishment failures can occur, so Pasture Genetics’ Establishment Guarantee™ programme* is available for the vital 30 day period after planting, and provides growers with substantial savings should they need to replant their paddocks.

Pasture Genetics is the only forage company in Australia to offer Establishment Guarantee™. Plant with peace of mind and the support of Pasture Genetics.

Register at pasturegenetics.com within 30 days of planting to participate in the programme.

* Terms and Conditions apply.
Rob Says

Australia is a land of extremes, highlighted over the last year of droughts and floods. However, in this time of adversity, the usefulness of lucerne on many farms across the country shines.

As the most frequently grown and highest yielding perennial forage legume crop across the globe, lucerne is highly efficient, producing more protein per unit area than any other forage legume. This is primarily due to its robust nature to survive harsh environments, and flexibility to thrive in more productive times.

Anywhere this diverse and adaptable species can be grown, producers should have lucerne in their pasture rotation. Sowing more lucerne on your farm is not only drought-proofing your future – its fast-tracking your productivity and profitability.

Pasture Genetics is the premier lucerne supplier in Australia, and we strive and continue to invest in the breeding, development and selection of the best lucerne varieties suited to the Australian environment.

The team at our Penfield Research Station are pushing lucerne cultivars to their limits. Across the country, our continual lucerne trial sites continue to deliver exceptional results, giving confidence in our current varieties for local producers, as well as selecting material for future variety development. Traits critical in our selection include the ability to withstand trampling and punishment from heavy and close grazing animals.

Currently, we are focusing on our most premium lucerne varieties, where both forage quantity and quality are equally important, with the development of our ‘Q’ series lucerne. ‘Q’ varieties, such as Q31 and Q75, have been tested explicitly in laboratory feed tests to ensure they deliver the highest quality feed when harvested. This comes from better leaf to stem ratio, as well as premium leaf holding capacity when making hay.

Superior pest and disease resistance also mean that these high-quality lucerne stands last longer and provide more value for both the grower and consumer.

We pride ourselves on our variety development process, and production and distribution of locally grown seed. Pasture Genetics exports lucerne varieties worldwide, which is a credit to the demand for quality lucerne genetics globally, and the ability of our seed growers to produce world-class seed of superior purity and germination.

Now is the time to take advantage of years of breeding and genetics focused on our local Australian conditions, as the rest of the world is starting to take notice of our achievements.

Please also take the time to contact any of our knowledgeable staff when planning your lucerne pasture sowing this year, as well as taking in the useful information contained within this guide.

Pasture Genetics has you covered with the Establishment Guarantee™ and our powerhouse Goldstrike® seed treatment package, to ensure that we are helping you secure the best result possible, and share any risk along the way.

I wish you all the best for the 2019 season and successful lucerne planting, and welcome your thoughts and feedback at rob.damin@pasturegenetics.com.
At Pasture Genetics we are always looking to new technology – constantly striving to improve our offering – bringing the latest technology, with even better performance to our leading forage products.

Goldstrike®

Pasture Genetics Goldstrike® includes rhizobia inoculation, micronutrient package and Apron® XL fungicide (where available on label). Goldstrike® is comprised of the highest quality seed and coating technology and is the best establishment package for pasture legumes.

Goldstrike LongLife®

Goldstrike LongLife® offers extended rhizobia storage life on a range of species. Goldstrike LongLife® can provide up to six months storage life on medic and sub clover, and up to 12 months storage life on lucerne.

XLR8™

XLR8™ treatment is a film coat application of Poncho® Plus insecticide.

Poncho® Plus is a significant advancement in the seed treatment market. It is an innovative insecticidal seed treatment that has registration across a range of pasture species and forage crops.

Poncho® Plus combines two robust compounds, imidacloprid and clothianidin, which increase the insect control spectrum above other seed treatment options. Poncho® Plus provides protection during establishment against a range of pests including Redlegged Earth Mite, Cutworm and Lucerne Flea. Poncho® Plus also offers added establishment vigour in the early growth stage of the plant.

The benefits from our XLR8™ seed treatment not only comes in the form of insect protection, but also shows long term benefit in assisting early seedling plant growth. This is demonstrated with greater root system development in seedlings, leading to higher overall pasture establishment and long-term pasture production.

Our XLR8™ seed treatment comes standard on all brassicas, herbs, and our premium proprietary lucerne varieties. Our XLR8™ seed treatment can be applied upon request to all seed products where registration is applicable.
Ash Jarvis
WAREHOUSE OPERATIONS AND LOGISTICS MANAGER

A calm, quiet achiever, Ash delivers the Pasture Genetics promise every day. “Starting at the bottom” in the warehouse, Ash has gained a deep understanding of the company’s commitment to meeting client expectations. He now manages a team of energetic staff whose responsibility is efficient order management and the seamless dispatch of pasture products to the world.

Age: 34
Pets: One cat, two dogs, and both a tank and a pond of fish.
Years at Pasture Genetics: 16 years
Quote I live by: “Keep it simple”
Describe your role in one sentence: Managing the day-to-day workflow with everything from blend scheduling, dispatch, and stock control within all depots – I like to think I am a ‘go-to man’ if you need to know where something is up to.
Last thing I Googled: Scott Bonner 45 Reel Mower
Favourite app: The AFL app for streaming footy on the go!
Last book read: Not sure exactly, but it would have been one of my kids’ books!
Social network I use the most: I don’t use social media a whole lot these days, but Instagram would be the one I use the most.
Tech gadget that changed my life: Smart phones. There’s not much they can’t do these days!
Favourite news source: An old-school newspaper.
What I enjoy most about my work: Working with a bunch of people that know how to have a laugh but also get the job done.
What do you find most interesting about agriculture: I’m interested in sustainable agriculture – without it we would be eating processed products that were made in a factory. There’s nothing like a juicy steak from grass fed cattle!
What challenges I face day-to-day: Stock availability is a key challenge for me. It changes so quickly I am often left asking “what happened to that 10 tonnes of stock?!”
The key to maintaining a successful long-term partnership with transport companies and depots: Understanding relationships go both ways; sometimes you have to give a little.
What’s your most treasured possession: They’re not a possession, but my wife and kids mean the most to me.
What’s your guilty pleasure: Saturday night beer and pizza.
What travel experience is on your bucket list: A sport related tour of the USA!
If you could have dinner with two famous people, who would you choose? Robin Williams (he would have been a blast) and Michael Jordan (I’d be hoping he could sign a couple of old trading cards!).

Above: Ash Jarvis and Tim Coulter in the Pasture Genetics warehouse, Wingfield, South Australia.
Tell us about your experience with Q31.

**Tom Damin (TD):** I started off with Q31 right from development and release. Throughout the process, the quality and consistency that the variety showed was remarkable.

**David Barker (DB):** We started off with Q31 because we wanted a fine stemmed but not stalky lucerne, we wanted to grow in summer, and I didn’t want any winter activity. I also wanted longevity. Because our bales are for horse feed, everyone is looking for that fine stemmed, leafy lucerne product that looks green and pretty.

**What are the key features and benefits of Q31?**

**TD:** High leaf-to-stem ratio, low set crown, winter dormant, very high pest and disease resistance and holds extra leaf in the bale.

**DB:** Maximum bales. We average around four to five weeks between cuts, and it established well without a lot of water. It’s also easy to cut, stands up and doesn’t lay over.

**How persistent is the variety and does it maintain good plant population over time?**

**TD:** Q31 is a highly persistent variety. I have seen good stands over eight years old (since the variety has been released), and they are still densely populated and productive. It hangs in there.

**DB:** The fact that our current stand is in its sixth year and we are getting the same amount of bales as we did in its second year means the plant population hasn’t changed. I can’t see it stopping, it will just carry on.

**Do you struggle with any weed competition?**

**TD:** Q31 can struggle a bit in its establishing year, but, as with all lucerne, preparation to reduce the weed burden is key. There are many good chemical options for in-crop weed control in established lucerne, but keeping a high plant population is the best thing you can do.

**DB:** We spray it out with spray seed during winter, although this year we didn’t because it was so dry. The lucerne does a great job competing with weeds, so we just mulched the paddock and the lucerne grew back strong.

**Has Q31 been a productive variety for yield?**

**TD:** In the first year it can lag behind some other varieties because it is a bit slow to establish and very winter dormant. However, in an irrigated hay production scenario, it is extremely high yielding compared with nearly all other varieties over a whole five year period or longer.

**DB:** Yes, it’s been one of the better varieties we’ve had. It has strong disease resistance, there are no pests or bugs – we get a few green aphids at the beginning and the end due to weather conditions, but once we cut it they’re gone. We’ve never sprayed it for bugs, because we have ladybirds right through it and we don’t want to kill them. We want to maintain the beneficial population.

**Are there any issues with growing Q31?**

**TD:** It takes a bit of time to get going, so you need to be patient with Q31 in its first year. Having said that, people are always impressed and glad they persisted with the slow establishment once it hits its straps in year two.

**DB:** Probably not. Like all lucerne the establishment can be tough, but once we got a good stand away it went. Once it’s established, it’s fine.

**Would you recommend Q31?**

**TD:** It is the best option for producing high quality hay in terms of quality and yield, and for growers like David, it is the only way to go!

**DB:** Yes - unless Pasture Genetics breed something better! It’s a good lucerne.
Dryland lucerne establishment

With Tim Francis

For many farmers this autumn and winter, their priority was to produce as much feed as possible. Grazing forage cereals and short-term ryegrass have been used widely to fill this feed gap. But in spite of this requirement for fast feed, there are still growers considering whether or not to sow dryland lucerne this season.

When the rain fell in parts of the country last spring and summer, the only green paddocks reliably seen were lucerne paddocks. These dryland stands came to life to provide high-quality feed when there was little to no other feed on offer, with this feed source helping stock management in drought conditions.

The perennial nature of lucerne is due to its deep, long tap root. The plants’ ability to store carbohydrates and draw moisture from deep in the soil profile means even with small rainfall events, the lucerne stand will respond well by producing high-quality feed. This makes it a great tool for drought-proofing your farm.

Establishing the lucerne stand at the right time for both soil temperature and soil moisture is key for the lucerne’s productivity. If the sowing window isn’t achievable in your area, a better option is to look at other pasture options like Pasture Genetics Subzero Hybrid Forage Brassica, or Balance Chicory. As lucerne growth rates through the winter months are limited, controlling winter weeds can be a costly exercise using selective herbicides. Targeting cleaner paddock or using pre-emergent chemicals will help aid the weed burden, and create a larger sowing window.

When establishing a dryland lucerne stand, some growers like to use cover crops like oats, wheat or barley. These cover crops are used as a ‘cash crop’ to aide in the cost recovery for establishing the new lucerne stand.

While there are benefits of having a cover crop – providing cover from wind drift and supplying some winter feed while the lucerne is dormant – they also compete with seedling lucerne, creating moisture stress and therefore reducing the number of plants establishing per square metre. Take a look at the picture above to compare the difference between a lucerne stand that has been sown under a cover crop, and where lucerne has been sown as a pure stand. Plant numbers in the pure stand (right) are far greater and healthier looking.

Insect monitoring is also key to establishing a healthy and productive lucerne stand. In tough, dry years, insects can build up very quickly. Redlegged Earth Mite can completely decimate an early establishing lucerne stand before the cotyledons appear out of the ground. Lucerne Flea is another common pest, causing loss of establishment vigour and seedling death in extreme cases. Pasture Genetics XLR8™ seed treatment, in conjunction with a bare earth spray, will help to control these insects.

A lucerne stand takes 12 months to fully establish, so be careful not to overgraze – especially over the first summer. Rotational grazing is the key, allowing the plant to fully recover after each grazing while also teaching the nearly formed lucerne plant to stool out, producing more shoots from the crown and base of the plant. While the plant is growing above the soil, it is also sending a taproot deep into the soil, chasing moisture well beyond the reach of other winter crops.

The key to establishing a dryland lucerne stand is to do your research – both on your paddocks, and with industry leaders. A great place to start is within this very magazine. Our best management practices section (page 12) outlines all the key questions you need to ask yourself, while providing useful information on lucerne criteria and requirements. Pasture Genetics are here to help you achieve great results, so please seek out your local professional territory managers to assist you with local knowledge and advice from their own experiences.

Images: Tim Francis, National Commercial Manager Pasture Genetics; The difference between a lucerne stand that has been sown under a cover crop, and where lucerne has been sown as a pure stand; Aphids in a newly formed lucerne stand.
A complete range of lucerne varieties for all applications is the hallmark of the Pasture Genetics lucerne breeding programme.

Pasture Genetics boasts the largest Australian lucerne breeding programme. The company currently has nine cultivars that fit the entire dormancy range, which means customers can decide on a specific choice of cultivar determined by soil type, climate and most importantly end use.

Pasture Genetics research and development places a significant focus on lucerne breeding. Success stories have included the development of GTL®60 Lucerne, one of a new generation of highly-productive lucerne varieties with superior grazing tolerance and persistence. New releases do not happen overnight. The release of GTL®60 Lucerne was the result of 12 years of selection, breeding and trialing, to ensure that only the very best, well-adapted lucerne was released to market.

The uptake and success of GTL®60 Lucerne has been rapid and widespread, from Central Queensland in the north to Tasmania in the south.

In 2012 the company also developed the first Australian accredited lucerne grazing trial protocol with the New South Wales Department of Primary Industries and IP Australia, an agency of the Department of Industry, Innovation and Science. This scrutinized current and experimental planting material and selected cultivars that could handle the heavy grazing from Australian sheep and cattle grazing systems.

Other lucerne products dominant in the market developed by Pasture Genetics include Q31, L70, L71, L91, L92, and ML99 MultiLeaf®. Planting Pasture Genetics lucerne is a direct investment in the continuation of one of Australia’s largest and most successful lucerne breeding programmes.
The quiet achiever: ML99 MultiLeaf® Lucerne

With Tom Damin

My journey with ML99 MultiLeaf® Lucerne began in my early years at Pasture Genetics, when I was involved in the Plant Breeder’s Rights application process for the variety.

This developed much of my early knowledge of not only lucerne as a plant, but in particular, how to observe different characteristics between lucerne varieties.

Most people are familiar with the most observable characteristics of lucerne; the rich dark green cover in a mature stand; the green leaf and look of quality in a well-made bale of hay; and the sweet, musky smell of high protein lucerne in silage. However, there are some subtle characteristics that make ML99 MultiLeaf® Lucerne stand out from the rest.

Currently, ML99 MultiLeaf® Lucerne is the only multi-leaf lucerne in the Australian market that is readily available. Pasture Genetics has new multi-leaf varieties coming through its breeding and development pipeline, but none are ready for release just yet.

The multi-leaf trait is expressed in a percentage of stems on a percentage of the plants, and can also vary based on the health and stress levels of the plant. The multi-leaf stems also tend to be expressed on the upper section of each main stem, the newer growth. A healthy and productive stand of ML99 MultiLeaf® Lucerne should express 80 per cent of plants with a multi-leaf stem, with up to 80 per cent of each of the trifoliate leaves being a multi-leaf instead. What all this adds up to is a higher leaf-to-stem ratio on ML99 MultiLeaf® Lucerne, giving a higher proportion of quality feed in each mouthful.

Another characteristic of most highly winter active lucerne varieties is long internode spacing between each trifoliate on the stem. This is typical in the tall, erect growing lucerne varieties that frequently offer the quickest regrowth, but result in hay with a very high and thick stem content. ML99 MultiLeaf® Lucerne typically has more trifoliates on each stem, and they are closer to each other than most other highly winter actives, which helps – along with the multi-leaf trait – to further achieve that high leaf-to-stem ratio growers chase for quality.

ML99 MultiLeaf® Lucerne is Pasture Genetics’ most successful export variety of lucerne seed, and I often feel like we have forgotten how well this variety has performed in Australia simply because it has been around for a while. The success of the variety internationally has been its versatility. It has robust establishment vigour and is tolerant of a wide range of soil types. Along with the high forage yield and quality from the multi-leaf trait, it has consistently been at the top of many domestic and international lucerne assessment trials.

In South Australia, where it was developed, the typical dry summer environment can make dryland lucerne establishment a tricky proposition, as spring and summer rain cannot be relied upon to get through with a spring sowing. ML99 MultiLeaf® Lucerne is a fantastic option for an autumn establishment due to its winter activity and speed of establishment. In most parts of South Australia, Northern Victoria and Central New South Wales, I would have no trouble recommending sowing in the autumn, as late as the end of May, and depending on your frost situation, early June. As always, preparation and planting into moisture is the key as well as a good weed knock down.

Along with its versatility across different soil types and climates, ML99 MultiLeaf® Lucerne also has excellent flexibility in its purpose of use. It can make award-winning quality hay but is perfect for dryland grazing situations too. Being highly winter active it can be prone to overgrazing, so be cautious in set stocking paddocks of ML99 MultiLeaf® Lucerne for long periods with hungry animals. Having said that, a well-managed stand can be productive for up to ten years with minimal thinning, subject to environmental conditions.

I would encourage anyone who wants a good ‘all-rounder’ lucerne variety, with country better suited to an autumn sowing, to give ML99 MultiLeaf® Lucerne a try. Along with Pasture Genetics Establishment Guarantee™ programme, you will be provided with the best chance for lucerne success.
### Paddock Selection and Preparation

Lucerne can be grown on a range of soils from deep sands to heavy clays. For best yield and persistence select paddocks with:

- Optimal range soil pH(CaCl2) 5.0 - 7.5
- Good natural slopes (for good drainage within the paddock)
- Adequate fertility (nutrient levels)

A surface and subsoil test is recommended to determine the suitability for lucerne. Soil acidity affects every stage of lucerne production from seedling establishment to stand survival. Incorporate lime three to six months before sowing where topsoil pH(CaCl2) is below 5.0. Avoid soils with acid subsoils or high levels of subsoil exchangeable aluminium (above five per cent). Apply gypsum to heavy soils (exchangeable sodium levels above six per cent) to overcome surface crusting problems.

Gypsum needs to be applied several months before sowing. Use deep ripping to break hard layers in the subsoil and to increase gypsum penetration to depth. Plan for weed control prior to and during the cropping phase to reduce the density and seed-set of major weeds.

Lucerne is sensitive to herbicide residue problems. The main carryover problems are associated with the triazines (e.g. simazine and atrazine), imidazolones (e.g. Midas®, OnDuty®, Spinnaker® following dry seasons) and sulfonyleurea herbicides (e.g. Glean®, Ally®, Logran® on high pH soils).

Test the soil using pots over summer or delay planting lucerne for at least one year after application of these residual herbicide groups.

### Before Sowing

If weeds are present before sowing use knockdown herbicides. At sowing pre-emergent herbicides such as Trifluralin should be applied in autumn, between four weeks and seven days, and in spring, between four weeks and three days, prior to sowing taking place.

These herbicides are a cheap option to control winter weeds (including annual ryegrass, wild oats, fumitory, annual phalaris and wireweed).

Maintain adequate stubble cover over summer but slash or late burn stubble before sowing. Use an appropriate cropping phase and/or sprays to reduce egg-laying mite populations in the growing season before lucerne establishment. Monitor paddocks for soil dwelling pests such as false wireworm and pink cutworm. Look for adequate soil moisture to 20 centimetres at time of sowing.

Pre-irrigation (where possible) and sowing into moisture is best practice for lucerne establishment.

### Fertiliser

Phosphorus is vital for early seedling growth and strong root development for better plant survival. Sow lucerne with a minimum of 15 - 20 units per hectare (dryland) and 20 - 40 units per hectare (irrigation). Banding fertiliser two to three centimetres below the seed is best. Molybdenum added to the fertiliser ensures good nodulation for greater nitrogen fixation by the lucerne. Lookout for adequate levels of sulphur, potassium, boron and zinc.

### Topdress with P and K

After the seeding year, annual applications of Phosphorus (P) and Potassium (K) help maintain stands and boost yields. Lucerne is a heavy user of soil nutrients, especially K. The incidence of nutrient deficiencies of P and K is increasing, particularly in paddocks with a long-term history of cropping (without adequate fertiliser) or hay production. P deficient lucerne has fine, spindly stems, and the leaves become narrow and often turn purple. A deficiency of K can not only reduce yield but it is essential for efficient nodulation, plant health (especially leaf disease and leaf retention under stress), stand persistence and winter hardiness. White spotting of the leaf margins is a common characteristic of K deficiency in lucerne. A good fertiliser rule of thumb is to top-dress annually with 10 - 20 kilograms per hectare or after the first cutting (but before regrowth starts) with six kilograms of P and 25 kilograms of K per tonne of forage harvested during the season. Always remove weeds before top-dressing.

Use soil test results and strip-tests to determine actual application rates needed for adequate fertility levels.

### Weed Control

Management practices that maximise lucerne growth will normally suppress weeds. The aim of post-emergent weed control in established lucerne is to suppress the weeds from excessive competition or setting seed and not necessarily eradicate all the weeds.

Removing grasses and other weeds in mid winter with a selective herbicide (winter cleaning) improves spring production and quality, extends the useful life of the stand and increases the benefit for the following grain crop.

### Sowing Technique

Lucerne should be sown into a level, firm and slightly cloddy seedbed. A separate small seeds box and narrow points allow accurate seed placement with reduced soil disturbance.

Plant lucerne paddocks first in your cropping programme. If stand density is patchy and below 10 plants (dryland) or 40 plants (irrigation), consider stand removal and re-seeding.

Lucerne is suited to under-sowing with winter crops or direct drilling into crop stubble after the grain harvest. Seeding rate of the cover crop should be reduced by 50 per cent and sown in skip (alternate) rows. A cover crop can help defray the costs of establishment and reduce soil erosion or wind sandblasting of lucerne seedlings on sand hills and sandy flats.
Seed Depth and Lucerne Emergence

<table>
<thead>
<tr>
<th>Depth (cm)</th>
<th>Percentage Emergence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sand</td>
</tr>
<tr>
<td>1.25 cm (0.5 inches)</td>
<td>71</td>
</tr>
<tr>
<td>2.50 cm (1.0 inches)</td>
<td>73</td>
</tr>
<tr>
<td>3.75 cm (1.5 inches)</td>
<td>55</td>
</tr>
<tr>
<td>5.00 cm (2.0 inches)</td>
<td>40</td>
</tr>
</tbody>
</table>

Seeding Rates (kg/ha) and Timing

<table>
<thead>
<tr>
<th>Variety</th>
<th>Marginal dryland</th>
<th>Good dryland and Tablelands</th>
<th>Irrigation and coast</th>
<th>Seeding Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>ML99 MultiLeaf®, L92, L91, Q75, L71, L70, GTL®60</td>
<td>2 - 4</td>
<td>4 - 8</td>
<td>10 - 20</td>
<td>Autumn, winter, spring</td>
</tr>
<tr>
<td>L56</td>
<td>1 - 3</td>
<td>4 - 6</td>
<td>10 - 20</td>
<td>Autumn, spring</td>
</tr>
<tr>
<td>Q31</td>
<td>1 - 3</td>
<td>4 - 6</td>
<td>10 - 20</td>
<td>Early autumn, spring</td>
</tr>
</tbody>
</table>

Guide to Seeding Rates of Cover Crops and Companion Species

<table>
<thead>
<tr>
<th>Cover Crops</th>
<th>Companion Species</th>
<th>Sown alone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barley</td>
<td>20 - 30kg/ha</td>
<td>2 - 3kg/ha</td>
</tr>
<tr>
<td>Lupins</td>
<td>40 - 50kg/ha</td>
<td>1kg/ha</td>
</tr>
<tr>
<td>Oats</td>
<td>25 - 35kg/ha</td>
<td>1 - 3kg/ha</td>
</tr>
<tr>
<td>Wheat</td>
<td>30 - 45kg/ha</td>
<td>2 - 3kg/ha</td>
</tr>
</tbody>
</table>

Optimum Plant Populations per m²

<table>
<thead>
<tr>
<th>Situation</th>
<th>Cover crops or pasture mixes</th>
<th>Sown alone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marginal dryland (&lt;400mm annual rainfall)</td>
<td>5 - 15</td>
<td>10 - 15</td>
</tr>
<tr>
<td>Good dryland (400 - 600mm annual rainfall)</td>
<td>10 - 15</td>
<td>15 - 25</td>
</tr>
<tr>
<td>Very good dryland / tablelands (over 600mm annual rainfall; cold climate)</td>
<td>15 - 25</td>
<td>25 - 40</td>
</tr>
<tr>
<td>High rainfall / coastal (600mm annual rainfall; warm climate)</td>
<td>25 - 40</td>
<td>40 - 60</td>
</tr>
<tr>
<td>Irrigation</td>
<td>Not recommended</td>
<td>60 - 150</td>
</tr>
</tbody>
</table>
Early Management

Seed treatment or bare earth emergence spray for Redlegged Earth Mites will pay dividends in the long run. Monitor seedlings carefully for aphids and use aphid resistant varieties. Grazing leniently the first time when the young stand is at least 20 centimetres high and well anchored. Lucerne established under cover crops should be allowed to flower before first cut or grazing.

Grazing Management

Rotational grazing is the preferred management system for lucerne. Grazing periods should be no longer than two weeks, followed by a three to six week rest period. This practice allows the plants to re-grow and replenish root reserves.

Larger mobs that fit the grazing unit (paddock size) allow quicker grazing. Alternatively, the use of high stocking rates is greatly assisted with strip grazing and electric fencing. Changing to August lambing gives better utilisation of lucerne in pastures.

Maintain flexibility with stocking rates and grazing management. Conserve excess feed as hay or silage to fill feed gaps or provide additional income. Rotational grazing with all varieties during summer and autumn will maintain production and persistence at a high level.

Avoid grazing waterlogged paddocks because soil compaction and trampling will reduce yield and lead to poor persistence. Set stocking during spring in good years will not harm the stand and may reduce the risk of bloat in cattle. To optimise stand longevity, allow lucerne to reach mid-flowering once during the year.

Too frequent cutting or set stocking for extended periods reduces overall yields, reduces vigour, which allows weed invasion and ultimately results in death of plants.

Irrigation

For high production of lucerne, irrigation management should aim to avoid any moisture stress. When water is in short supply, it is possible to extend the irrigation interval more than shallow rooted pasture to maintain lower levels of production.

Irrigation layout and practice should ensure water penetrates at least 80 to 100 centimetres and permit drainage within eight hours to minimise waterlogging. Do not irrigate immediately after hay is harvested to reduce the risk of scalding, particularly during summer. Time the final irrigation to allow adequate dry-down of the soil surface to prevent soil compaction by harvesting machinery.

SUB-SURFACE DRIP IRRIGATION

Low volume emitters, moulded onto the internal wall of a polyethylene tube and buried 200 millimetres to 300 millimetres below the soil surface, is recognised as the most efficient means of irrigating lucerne (95 per cent WUE) and is becoming increasingly popular as water availability declines and the cost of water increases.

These sub-surface drip irrigation laterals are spaced across the paddock at distances from 0.3 to 0.8 metres apart, depending on soil and crop requirements. As the water (and fertiliser) is delivered right to the root-zone (where it is needed) in measurable and adjustable quantities it not only saves water but has a positive effect on plant productivity, longevity and health.

As opposed to flood and spray irrigation, excess water does not collect on the surface and hence growers can manage their cutting times more effectively, there is less weed growth and no compaction is caused by harvesting equipment.

Sub-surface drip irrigation also requires very little labour to operate and maintain.

Livestock Health

Cattle grazing lucerne pastures during the bloat season (winter and spring) are susceptible to bloat. Frequent observation of stock on lucerne is essential. To manage bloat use high stocking rates and avoid placing hungry stock on immature lucerne.

Allowing stock access to grass, stubble or hay while they are grazing lucerne and the use of bloat oil and/or rumen capsules will effectively reduce the incidence of bloat. Vaccinate stock with “5 in 1” to prevent pulpy kidney, which is sometimes confused with bloat. Red gut can affect sheep and lambs that are grazing pure stands of lucerne during similar weather conditions, which can result in bloat. At the first sign of red gut (sudden death) affected flocks should be removed immediately. Manage red gut the way you would bloat for cattle.

BLOAT REDUCTION OPTION

Pasture Genetics’ SOWsmart® Bloat Fighter Blend has been especially designed as a pasture blend option to reduce the instance of bloat on straight lucerne based pastures. This mix has incorporated two lucerne companion species, Zulumax Arrowleaf Clover and Balance Chicory that have proven anti-bloating properties.

Haymaking

Before adopting a haymaking enterprise, organise a market in advance and consistently meet market requirements. Generally, aim for high quality as well as high yields to optimise animal performance and long-term profitability.

Mechanical field losses during haymaking can be large (20 - 40 per cent). Aim to mow early in the day and minimise handling during the curing process.

Chaff varietal selection

The traditional chaff market has been based around the horse feed industry. Lucerne has been a sought after product to meet the market requirements. When selecting a lucerne variety to target chaff quality we look for material that has a high leaf to stem ratio. It is important to maximize the softness of the leaf but still maintain the functional fibre. There are four Pasture Genetics’ lucerne varieties that can be utilised, ML99 MultiLeaf® Lucerne and Q75 Lucerne - winter active lines, or L56 Lucerne and Q31 Lucerne - semi-winter dormant lines. The management of each line is very important to achieve the desirable quality. With highly winter active lines it is important to cut in the earlier stage of maturity to maintain maximum leaf compared to stem. The window of opportunity with varieties such as L56 Lucerne and Q31 Lucerne is quite wide due to the higher leaf trait of these lines. This in turn allows for high quality across a high percentage of cuts.
Nutrient Removal

To maintain the health of lucerne stands replace soil nutrients removed in hay. Soil and leaf tissue tests conducted annually in early spring help ensure other nutrients are adequate.

### Nutrient Removal

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Amount removed in 1 DM t of hay</th>
<th>Seasonally in 15 DM t/ha of hay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen (N)</td>
<td>20 - 30kg</td>
<td>375kg</td>
</tr>
<tr>
<td>Phosphorus (P)</td>
<td>2 - 3kg</td>
<td>37kg</td>
</tr>
<tr>
<td>Potassium (K)</td>
<td>15 - 20kg</td>
<td>262kg</td>
</tr>
<tr>
<td>Sulfur (S)</td>
<td>2 - 4kg</td>
<td>45kg</td>
</tr>
<tr>
<td>Calcium (Ca)</td>
<td>13 - 17kg</td>
<td>225kg</td>
</tr>
<tr>
<td>Magnesium (Mg)</td>
<td>3 - 4kg</td>
<td>52kg</td>
</tr>
</tbody>
</table>

Source: University of Nevada-Reno. All values on a dry-matter basis.
Intake = % of body weight, CP = % Crude Protein, ADF = % Acid Detergent Fibre, DDM = % digestible dry matter.

Re-sowing and Crop Rotation

High producing lucerne will generally require re-sowing after four to seven years. Winter active stands will often decline sooner than winter dormant ones. Thickening up an old and thinning lucerne stand fails more than it succeeds. It is best practice to completely remove old lucerne plants and allow at least three weeks between herbicide application and re-sowing. There are significant benefits in rotating lucerne paddocks with winter cereal or canola crops to control weeds, use soil nitrogen, break disease and insect cycles, manage in-crop herbicide resistance as well as increase whole farm profits.

Measuring Forage Quality

**Weight gain effect based on feed quality (180 to 275 KILOGRAM steer calves)**

<table>
<thead>
<tr>
<th></th>
<th>Pre-bud</th>
<th>Bud</th>
<th>Early</th>
<th>Full</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP</td>
<td>23</td>
<td>20</td>
<td>17</td>
<td>14</td>
</tr>
<tr>
<td>ADF</td>
<td>21</td>
<td>26</td>
<td>34</td>
<td>43</td>
</tr>
<tr>
<td>DDM</td>
<td>73</td>
<td>69</td>
<td>62</td>
<td>55</td>
</tr>
<tr>
<td>Intake</td>
<td>3.5</td>
<td>3</td>
<td>2.5</td>
<td>2</td>
</tr>
<tr>
<td>Daily Gain (kgs)</td>
<td>1</td>
<td>0.86</td>
<td>0.55</td>
<td>0.36</td>
</tr>
<tr>
<td>kg of feed (gain)</td>
<td>3.2</td>
<td>4.07</td>
<td>5.5</td>
<td>6.75</td>
</tr>
</tbody>
</table>

Cutting and grazing tips

<table>
<thead>
<tr>
<th>Variety</th>
<th>Recommended Grazing Practice/Number of Paddocks</th>
<th>Recommended Cutting Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>ML99 MultiLeaf®, L92, L91, Q75, L71, L70, QTLR60</td>
<td>Strict rotation/6 - 7 paddock rotation</td>
<td>25 - 28 days</td>
</tr>
<tr>
<td>L56</td>
<td>Flexible grazing period (up to 3 weeks)/5 - 4 paddock rotation</td>
<td>33 - 35 days</td>
</tr>
<tr>
<td>Q31</td>
<td>As for L56</td>
<td>38 - 42 days</td>
</tr>
</tbody>
</table>

BUD DEVELOPMENT

The appearance of two centimetre long shoots from the crown on just over half the plants is the most reliable indicator of when to cut or graze for maximum productivity and persistence of lucerne.
**Lucerne Varietal Selection Chart**

Selecting the right variety for your paddocks

**What is the purpose for sowing?**
- Winter dormant
- Semi-winter dormant
- Winter active

**When is the feed required?**
- Winter dormant
- Semi-winter dormant
- Winter active

**How long do I want the stand to last?**
- Winter active

### Variety

<table>
<thead>
<tr>
<th>Variety</th>
<th>Q31 Lucerne</th>
<th>L56 Lucerne</th>
<th>GTL®60, L70, L71, Q75, L91, L92, ML99 MultiLeaf® Lucerne</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Establishment Vigour</strong></td>
<td>Good. Best sown alone - not recommended for winter sowing</td>
<td>Very good - suitable for cover cropping and pasture mixes with perennial grasses</td>
<td>Excellent - suitable for cover cropping and pasture mixes with annual pastures</td>
</tr>
<tr>
<td><strong>Growth</strong></td>
<td>95 per cent summer, 5 per cent winter</td>
<td>90 per cent summer, 10 per cent winter</td>
<td>80 per cent summer, 20 per cent winter</td>
</tr>
<tr>
<td><strong>Winter-Hardiness</strong></td>
<td>Very high</td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td><strong>Maturity</strong></td>
<td>Shorter growth. Delayed maturity for maximum cutting and grazing flexibility</td>
<td>Similar regrowth rates to most winter actives. Extended cutting schedule and grazing period</td>
<td>Fast regrowth, early maturity</td>
</tr>
<tr>
<td><strong>Crown</strong></td>
<td>Below ground and broad - excellent grazing tolerance</td>
<td>Low and broader - good grazing tolerance</td>
<td>High and erect - strict rotational grazing</td>
</tr>
<tr>
<td><strong>Forage Quality</strong></td>
<td>Premium grade hay, chaff and silage</td>
<td>Very good quality hay, chaff and silage</td>
<td>Good quality hay and silage if given the best cutting management</td>
</tr>
<tr>
<td><strong>Adaptation</strong></td>
<td>Irrigation/coastal/cold climates. Best suited to medium and heavy soils</td>
<td>Dryland and irrigation. Suitable for soils ranging from deep sands to heavy clays</td>
<td>Dryland and irrigation. Suitable for most soil types</td>
</tr>
</tbody>
</table>

### Lucerne Varietal Selection Chart

<table>
<thead>
<tr>
<th>Dormancy</th>
<th>W</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity</td>
<td>Winter Dormant</td>
<td>Semi-winter Dormant</td>
<td>Winter Active</td>
<td>Winter Active</td>
<td>Highly Winter Active</td>
<td>Very Highly Winter Active</td>
</tr>
<tr>
<td>Irrigation - High Quality Hay</td>
<td>Q31</td>
<td>L56</td>
<td>GTL®60</td>
<td>Q75</td>
<td>L91, L92</td>
<td>ML99 MultiLeaf®</td>
</tr>
<tr>
<td>High Quality Dryland</td>
<td>Q31</td>
<td>L56</td>
<td>GTL®60</td>
<td>L71, Q75</td>
<td>L91, L92</td>
<td>ML99 MultiLeaf®</td>
</tr>
<tr>
<td>Heavy Grazing Tolerance</td>
<td>Q31</td>
<td>L56</td>
<td>GTL®60</td>
<td>L71</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Price Competitive Dryland</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>L70</td>
<td>L91</td>
<td>-</td>
</tr>
</tbody>
</table>

### L70 v Aurora

**Yield Results and Pricing Comparison**

L70 Lucerne offers very competitive pricing to Aurora and therefore similar per hectare input seed costs.

<table>
<thead>
<tr>
<th>Variety</th>
<th>L70 Lucerne</th>
<th>Aurora</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total yield</td>
<td>18.5 t/ha</td>
<td>17.0 t/ha</td>
</tr>
<tr>
<td>Hay returns/ha at $200/t</td>
<td>$3,700/ha</td>
<td>$3,400/ha</td>
</tr>
<tr>
<td>Extra hay returns $300 per hectare, per year</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

![Eight per cent yield increase chart](chart)
ML99 MultiLeaf®

**Medicago sativa**

**Winter Activity** 7

**Min Rainfall (mm)** 250

<table>
<thead>
<tr>
<th>Seeding Rate</th>
<th>kg/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dryland</td>
<td>4-8</td>
</tr>
<tr>
<td>High Rainfall/Irrigation</td>
<td>10-20</td>
</tr>
<tr>
<td>Hay production</td>
<td>25-30</td>
</tr>
</tbody>
</table>

**Seed Treatment**  Goldstrike LongLife® XLR8™

- ML99 MultiLeaf® Lucerne has been developed to incorporate a new level of quality and production in winter active lucerne. This increase in production is driven by high expression of multi-foliate leaves, plus all the qualities currently required by lucerne growers.
- Growers looking for winter grazing with options to cut quality hay.
- Very highly winter active cultivar.
- Near to 100 per cent true to type multifoliate expression.
- 40 per cent more leaflets than conventional lucerne.
- Superior stand life based on broad disease and nematode resistance.
- Frost tolerant to protect cold season production.

L92

**Medicago sativa**

**Winter Activity** 9

**Min Rainfall (mm)** 350

<table>
<thead>
<tr>
<th>Seeding Rate</th>
<th>kg/ha</th>
</tr>
</thead>
<tbody>
<tr>
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<td>10-20</td>
</tr>
<tr>
<td>Hay production</td>
<td>25-30</td>
</tr>
</tbody>
</table>

**Seed Treatment**  Goldstrike LongLife® XLR8™

- L92 Lucerne is set to become the leading winter active variety for the dual purpose hay and grazing markets.
- Selected for triple-race anthracnose resistance.
- Highest forage yield in the highly winter active group.
- Excellent seedling vigour to aid in quick establishment.
- High resistance to multiple pests and diseases.
- Increased persistence for a highly winter active lucerne.
- Very quick regrowth after cutting or grazing.
- Ideally suited to wide range of soil types.

L91

**Medicago sativa**

**Winter Activity** 9

**Min Rainfall (mm)** 350

<table>
<thead>
<tr>
<th>Seeding Rate</th>
<th>kg/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dryland</td>
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<td>10-20</td>
</tr>
<tr>
<td>Hay production</td>
<td>25-30</td>
</tr>
</tbody>
</table>

**Seed Treatment**  Goldstrike LongLife®

- The easy-grow winter active lucerne.
- Extended grazing and hay in autumn and winter.
- Best in cropping rotations and dairy pastures.
- Preferred variety for winter sowing.
- Outstanding seedling vigour for quicker establishment.
- Suitable for all areas, with exceptional productivity on red brown earth and other light soils that are tolerant of saline conditions.
- High resistance to Spotted Alfalfa Aphid, Colletotrichum Crown Rot, and Fusarium wilt, and is highly resistant to Phytophthora root rot.
- Price competitive option to Sequel.

Q75

**Medicago sativa**

**Winter Activity** 7

**Min Rainfall (mm)** 350

<table>
<thead>
<tr>
<th>Seeding Rate</th>
<th>kg/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dryland</td>
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<tr>
<td>High Rainfall/Irrigation</td>
<td>10-20</td>
</tr>
<tr>
<td>Hay production</td>
<td>25-30</td>
</tr>
</tbody>
</table>

**Seed Treatment**  Goldstrike LongLife® XLR8™

- The “Q” in Q75 Lucerne signifies the variety has demonstrated superior quality characteristics in laboratory tests and animal feeding trials.
- Q75 has set a new benchmark in forage quality for the Australian lucerne industry with the highest forage quality, Relative Feed Value (RFV) and protein in the winter active group.
- Highest forage quality in the winter active group.
- Dual purpose grazing and hay option.
- High resistance to multiple pests and diseases.
- Better persistence than most winter active varieties.
- Excellent leaf holding capacity.

L71

**Medicago sativa**

**Winter Activity** 7

**Min Rainfall (mm)** 350

<table>
<thead>
<tr>
<th>Seeding Rate</th>
<th>kg/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dryland</td>
<td>4-8</td>
</tr>
<tr>
<td>High Rainfall/Irrigation</td>
<td>10-20</td>
</tr>
<tr>
<td>Hay production</td>
<td>25-30</td>
</tr>
</tbody>
</table>

**Seed Treatment**  Goldstrike LongLife® XLR8™

- L71 Lucerne was formed from the partnership between the New South Wales Department of Primary Industries lucerne breeding programme and Pasture Genetics.
- L71 Lucerne out performs its predecessor Genesis by four per cent on average in both dryland and irrigated conditions.
- Tested for all three races of anthracnose.
- Dryland specialist targeting grazing and hay production.
- L71 Lucerne has demonstrated excellent grazing tolerance with 65 per cent residual plants after three years of grazing.
- Excellent persistence in low rainfall dryland conditions.
- High forage quality and leaf retention.

L70

**Medicago sativa**

**Winter Activity** 7

**Min Rainfall (mm)** 350

<table>
<thead>
<tr>
<th>Seeding Rate</th>
<th>kg/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dryland</td>
<td>4-8</td>
</tr>
<tr>
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<td>10-20</td>
</tr>
<tr>
<td>Hay production</td>
<td>25-30</td>
</tr>
</tbody>
</table>

**Seed Treatment**  Goldstrike LongLife®

- L70 Lucerne offers higher disease and pest package compared to Aurora.
- Superior forage genetics - higher leaf to stem ratio.
- Minimum 90 per cent germination standards exceeds current minimum certified standard for Aurora of only 60 per cent.
- L70 Lucerne seed production is derived from dryland seed production stands only. This ensures the dryland integrity and performance of L70 Lucerne is maintained when utilised in dryland grazing enterprises.
- These attributes, combined with superior plant genetics, makes L70 Lucerne an excellent new alternative to Aurora.
## LUCERNE

### GTL®60

<table>
<thead>
<tr>
<th>Lucerne</th>
<th>Medicago sativa</th>
<th>Winter Activity</th>
<th>Min Rainfall (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>6</td>
<td>350</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Seeding Rate</th>
<th>kg/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dryland</td>
<td>4-8</td>
</tr>
<tr>
<td>High Rainfall/Irrigation</td>
<td>10-20</td>
</tr>
<tr>
<td>Hay production</td>
<td>25-30</td>
</tr>
</tbody>
</table>

**Seed Treatment** Goldstrike LongLife® XLR8™

- Selected for a broad and low-set crown, high forage values, high ruminant palatability with high disease, and pest resistance ratings.
- Tested under an arduous series of strict grazing protocols over five years.
- Ideally suited as a dual-purpose variety for grazing and hay operations.
- Quick recovery after defoliation gives the ability to store plant energy into the crown.
- Retain leaf through the drying and baling process.
- Good adaptability to a wide range of soil types.
- GTL®60 Lucerne has demonstrated excellent grazing tolerance with 74 per cent residual plants measured after three year grazing trial.

### L56

<table>
<thead>
<tr>
<th>Lucerne</th>
<th>Medicago sativa</th>
<th>Winter Activity</th>
<th>Min Rainfall (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>350</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Seeding Rate</th>
<th>kg/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dryland</td>
<td>4-8</td>
</tr>
<tr>
<td>High Rainfall/Irrigation</td>
<td>10-20</td>
</tr>
<tr>
<td>Hay production</td>
<td>25-30</td>
</tr>
</tbody>
</table>

**Seed Treatment** Goldstrike LongLife® XLR8™

- The master dual purpose grazing and hay lucerne in Australia.
- Exceptional seedling vigour.
- Very high yields.
- Exceptional forage quality.
- New industry benchmark for persistence.
- Flexible management option.
- Highest levels of pest and disease resistance of any lucerne variety in Australia. Phytophthora root rot rating of HR+.
- Semi-winter dormant.
- Adaptable across a wide range of soil types.
- Very good grazing tolerance.

### Q31

<table>
<thead>
<tr>
<th>Lucerne</th>
<th>Medicago sativa</th>
<th>Winter Activity</th>
<th>Min Rainfall (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>450</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Seeding Rate</th>
<th>kg/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dryland</td>
<td>4-8</td>
</tr>
<tr>
<td>High Rainfall/Irrigation</td>
<td>10-20</td>
</tr>
<tr>
<td>Hay production</td>
<td>25-30</td>
</tr>
</tbody>
</table>

**Seed Treatment** Goldstrike LongLife® XLR8™

- Quickly been adopted as the leading hay and chaffing variety for premium markets.
- A superior leaf retention trait, and the highest nutritive value in retained leaf in feed and hay. High yields and excellent quality for grazing, silage, hay and chaff.
- Demonstrates greater persistence than winter active varieties, when persistence is more important than winter growth.
- Bred for specialist irrigated haymaking, silage or chaff, where premium quality is required and where hay cannot be made in winter.
- Ideally suited to leaders in forage quality.

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### PENFIELD RESEARCH STATION

**Pasture Genetics has its own centralised research and seed treatment facility**

Pasture Genetics opened its centralised research and development, and seed treatment facility, Penfield Research Station at Virginia, South Australia in 2008. This 18 hectare site enabled the company to undertake long running animal grazing feed trials and world class breeding programmes.

Among these is the Pasture Genetics Live Weight Gain Trial (see pages 31 and 34 for results), which celebrated its tenth year of on-going work in 2018. This rotational grazing trial measures cattle live weight performance on different pasture species including annual ryegrass, festulolium, forage cereal, Italian ryegrass, lucerne, and perennial ryegrass products. This information has been invaluable for agronomists and farmers to select products based on first-hand paddock performance.

Based on this success, further beef cattle and sheep grazing trials have been administered to measure variety performance, and to provide production data which has previously not been available to farmers.

Penfield Research Station is the home base for Pasture Genetics’ research and development business unit. It is also the site of the its two Goldstrike® seed treatment plants, as well as its export-specific warehouse and distribution facility. With an on-site state of the art laboratory, and purpose-built education centre, Penfield Research Station also facilitates industry training. Pasture Genetics provide workshops and certification courses, as well as educational field days, specific to forage pasture species, to Australian agronomists and industry representatives.

For more than a decade Penfield Research Station has become the hub for technical services and expertise in the Australian forage seed industry.
At Pasture Genetics, we have Australia’s most comprehensive lucerne breeding programme. For the last five years, we have trialled GTL®60 Lucerne under the most extreme grazing conditions. It has been grazed over 50 times in the last five years.

GTL®60 Lucerne continues to exhibit elevated levels of residual plants and the ‘high relative feed value’ trait that Pasture Genetics’ varieties are known for. You can have high levels of grazing tolerance, long-term persistence and the ability to cut high quality hay.

Our lucerne growers tell us that their key requirements for a lucerne variety are ‘productivity, persistence and quality’ – and with GTL®60 Lucerne, we can tick all those boxes. Our lucerne varieties are bred in Australia, for Australian growing conditions. They also come with our unique Establishment Guarantee™, which reduces the risk when establishing a new stand.”

Tom Damin
Research and Technical Services Manager

Order your Pasture Genetics GTL®60 Lucerne from your local rural store

* Terms and Conditions apply.
David Barker runs a mixed cropping farm in Virginia, South Australia, where he has a 5.5 hectare paddock of Pasture Genetics Q31 Lucerne that has been in full production for the last six years.

Lucerne hay is a sought-after commodity in the surrounding Adelaide plains region, thanks to the local equine market.

David share-farms irrigated country with his neighbour, and as a contractor himself, has all the haymaking equipment required to turn his lucerne into small square bales, as well as storage to capitalise on off-season sales of his product.

David chose Q31 Lucerne for its high leaf-to-stem ratio, leaf retention and excellent pest and disease resistance. With no livestock available to graze the lucerne in the winter and an inability to cure hay during that time, David relies on weed control and mulching – so a variety like Q31 Lucerne with proper winter dormancy was ideally suited to his operation.

Once the lucerne starts to fire-up in September, David says the recipe is simple. “We cut about every five weeks, and usually achieve five to six cuts a year. We average about 1,000 small bales per cut,” he said.

Over the past five seasons, David’s hay production has ranged from 5,500 to 6,300 bales per season depending on climatic conditions. With an average bale weight of 22 to 25 kilograms, David has an estimated production figure of just over 20 tonnes of hay per hectare each year.

Taking care of the stand is of critical importance for David. “We use reclaimed irrigation water, so probably use a bit less fertiliser than on other crops,” David said.

“Every two years we use 178 kilograms per hectare of Rapid Raise in early autumn, and 178 kilograms per hectare of Pivot Lucerne Special after the second cut.”

The stand is still persisting, even at the end of its sixth season. “The plant numbers are still there and no weeds are giving us trouble. Usually we would expect five to six years from a hay paddock, but I don’t see the point in taking this out yet. We are looking at 6,000 bales again this year and might just push the record,” David said.

See page 18 for Q31 Lucerne product information

“Big cuts and big yields with Q31 Lucerne”

By Tom Damin

“’We cut about every five weeks, and usually achieve five to six cuts a year. We average about 1,000 small bales per cut.””

DAVID BARKER
Dave Metcalf had a history of growing highly winter-active varieties but found that they were not persisting long enough on his family-run operation at Caffey in the Lockyer Valley, Queensland.

He decided to put Pasture Genetics’ winter dormant variety L56 Lucerne to the test, which he has been extremely pleased with.

In addition to the L56 Lucerne, Dave said he was also chasing a variety with slightly more winter vigour – particularly on the shoulders of the cooler months – to get the last cut later and the first cut off quicker.

Even though Dave is still cutting the L56 Lucerne close to every eight weeks through the winter months, the L71 Lucerne introduced into the mix has increased their on-farm versatility and production.

Dave planted 40 acres of L71 Lucerne over two blocks in June 2018 at a planting rate of 25 kilograms per acre. Under irrigation, Dave finds this planting rate suits his country where he gets a great strike to help out-compete hard-to-control perennial weeds such as nutgrass.

Since planting L71 Lucerne, the property has suffered through one of the hottest and driest periods on record.

“Right now its hit with grasshoppers, and on top of that, even amongst the combined lack of rain and limited irrigation, it is still producing,” Billy said.

“L71 Lucerne has certainly proven to be a suitable fit for our operation as it is cutting good quality hay, despite our tough seasons and no significant rainfall.”

See page 17 for L71 Lucerne product information

Image: Billy Neville’s stand of L71 Lucerne before cutting.

L71 Lucerne provides flexibility for Queensland farmer

By Hugh Graham

Billy Neville is a long-time hay producer in the Upper Hunter Valley region of Sandy Hollow, New South Wales.

Working alongside his local agronomist, he selected Pasture Genetics L71 Lucerne as the variety that could withstand the harsh environmental conditions that Sandy Hollow presents.

Billy has now sown two blocks to L71 Lucerne. The first was sown in 2017, and the second was sown more recently, in September 2018. This September planting was sown at 25 kilograms per hectare with the addition of Cotton Sustain (NPK +Zn) at 200 kilograms per hectare.

The L71 Lucerne established very quickly, producing a solid stand in a very tough year. “It was a tough year that tested the establishment to the limit,” Billy said.

“Given we’ve had very little rainfall, and with water at a premium, I have only watered the stand a few times, but despite the dry conditions it’s done an exceptional job. “Since establishment, I have cut the stand three times producing over 1,660 small bales to date.

“The small bales are of high quality and show the outstanding breeding and toughness of this variety.

L71 Lucerne is the result of a partnership between Pasture Genetics and the New South Wales Department of Primary Industries. With excellent parentage, L71 Lucerne outperforms its predecessor Genesis by four per cent on average, both in dryland and irrigated situations.

L71 Lucerne is also resistant to all three races of anthracnose and is a specialist dryland option due to its low crown and superior grazing tolerance. As well as been an exceptional grazing variety, it makes fantastic hay due to its high leaf retention and forage quality.

“Right now its hit with grasshoppers, and on top of that, even amongst the combined lack of rain and limited irrigation, it is still producing,” Billy said.

“L71 Lucerne has certainly proven to be a suitable fit for our operation as it is cutting good quality hay, despite our tough seasons and no significant rainfall.”

See page 17 for L71 Lucerne product information

Image: Billy Neville’s stand of L71 Lucerne before cutting.
Neil Coghill runs a dairy operation in Rochester, Victoria, and has been growing Pasture Genetics’ L70 Lucerne to great success over the past five years.

In this time, Neil has seen the increased benefits of running a large proportion of lucerne in his programme, including affordability, without compromising on quality. The L70 Lucerne’s affordability in his rotation has allowed Neil to keep a pure lucerne stand for two to three years, where he gets the most hay and silage cutting. He then oversows with either oats or ryegrass to make the most of its winter activity as a mixed grass and legume grazing system.

“The winter activity has been beneficial, as it’s allowed me to graze the cows throughout the winter on quality feed,” Neil said.

Previously, Neil sowed his lucerne in spring after a cereal crop but uncovered much better results by sowing following a Bounty Forage Sorghum summer crop.

“Sowing after the sorghum allowed me to clean up the paddock then direct drill into the stubble ready for lucerne to graze that spring,” said Neil.

By sowing his lucerne at around 25 kilograms per hectare, Neil ensures that he has sufficient plant numbers to increase production and reduce bare areas for weeds. His fertiliser programme also allows him to push the envelope with the amount of lucerne production he can achieve throughout the winter months.

“It was amazing to see lucerne well above my knee and realise how much production was possible when it was pushed through the winter,” Neil said.

See page 17 for L70 Lucerne product information

Image: Neil Coghill in his two year old L70 Lucerne stand that is still holding exceptional plant numbers.

Q75 consistently produces high-quality lucerne for chaff

Geoff and Angela Hose of ‘Cressbrook Creek Chaff’ at Toogoolawah, Queensland, strive to produce a high-quality product to satisfy their clients throughout South East Queensland.

“Producing a high-quality product consistently is the key to maintaining a strong, loyal following with customers,” said Geoff.

“Producing quality is the challenge, and Pasture Genetics’ Q75 Lucerne has proven to be very consistent and capable with both quality and yield.

“It holds its leaf and colour extremely well, which is attractive in a bag of chaff,” he said.

The ‘Q’ in Q75 Lucerne signifies the variety has demonstrated superior quality characteristics in laboratory feed tests and animal feeding trials across Australia. Geoff had previously experienced success with another Pasture Genetics variety – Q31 Lucerne – that also displays the superior quality characteristics, but was seeking a more winter active variety with high quality.

In this instance, Q75 Lucerne was selected and sown in late May 2018 at approximately 20 kilograms per hectare under irrigation.

“The establishment was very good considering the extremely cold winter,” said Geoff.

The Q75 Lucerne endured consistent frosts over many weeks throughout winter and has performed exceptionally well throughout the season.

“It has had a tough start with the very cold winter and now extreme dry conditions throughout the summer, but the quality has remained very consistent throughout.

“The dry conditions have made it very challenging to maintain irrigation supply across the farm, but the Q75 Lucerne does respond well,” Geoff said.

Q75 Lucerne has proven to be a reliable source of quality lucerne for the Hose’s operation, with Geoff now planning to sow more paddocks with Q75 Lucerne in 2019.

See page 17 for Q75 Lucerne product information

Image: Geoff and Angela Hose of ‘Cressbrook Creek Chaff’.

By Tom McCooey

By Michael Christensen

FARMER FEEDBACK

PASTURES Lucerne Update 2019

22
Rick Blackshaw is a dairy farmer from Goon Nure, in the East Gippsland district of Victoria. Like many areas throughout Australia, Goon Nure has suffered through one of their worst droughts on record – but even in these testing conditions, Rick’s stands of Pasture Genetics ML99 MultiLeaf® Lucerne have not let him down.

Rick uses his paddocks of ML99 MultiLeaf® Lucerne solely for silage production, which he feeds to his milking herd. “The cows love it – they don’t leave any behind,” said Rick. “It converts extremely well to milk, and we get great tonnage, so it certainly makes my job easier.”

Rick has found silage to be the most efficient method of increasing milk production from the lucerne stands, and believes the high quality of the silage could be attributed to ML99 MultiLeaf® Lucerne’s multi-leaf trait, fine stems and ability to retain leaf in the bale.

ML99 MultiLeaf® Lucerne was first sown on Rick’s dairy farm in 2007 under an 85-acre lateral move irrigator. This stand lasted for an impressive eight years, averaging 1,200 bales of silage per year. In its peak, up to 280 bales of silage were cut six times per year. Rick attributes this fantastic result to regular fertiliser application with trace elements in-line with the Albrecht system.

Rick manages his crop meticulously well, with regular tissue testing to ensure nothing is lacking. This shows in the paddock, with the majority of plants expressing the multi-foliate trait with up to an impressive nine leaflets per leaf.

After two years sown to alternate forage oat and millet crops to utilise the available nitrogen, the original paddock, plus an additional 35 acres, was re-sown to ML99 MultiLeaf® Lucerne – and Rick couldn’t be more pleased with the results of his last crop. “It was never a question as to which variety we were going to plant,” he said.

The seed germination this time around has been superior with a massive number of plants per square metre. Sowing at 30 kilograms per hectare ensures a rapid establishment to reduce the weed burden and the time to first cut. The new stand is currently being cut for the third time since sowing three and a half months ago, and is on track to remain a crucial component in the Blackshaw system for many years yet.

See page 17 for ML99 MultiLeaf® Lucerne product information.

“…they don’t leave any behind.”

RICK BLACKSHAW
The sandy soils of 'Emu Springs Dairy' in the Upper South East of South Australia require a lucerne that can flourish in challenging conditions – so owner Russell Foote and partners selected Pasture Genetics’ GTL®60 Lucerne.

They took over the farm nearly two years ago, and knew that producing home-grown fodder was going to be the key element to their profitability.

'Emu Springs Dairy' milks up to 740 crossbred cows and is a medium input farm that focuses on direct grazed home-grown fodder to keep the cost of production down.

Russell says they split calf with 70 per cent in the spring and 30 per cent in the autumn to make the best use of the fodder production curve. The farm is mostly sown down to lucerne, with paddocks oversown with barley to bulk up the winter feed.

Russell is impressed with the paddock of GTL®60 Lucerne, sown in May 2018, as it established well and was able to be grazed three times in the first six months. This wasn’t something he predicted, but believes it was due to the paddock being sown early into warm soil, with a good seeding rate and using Goldstrike® inoculated seed.

The paddock, which is irrigated by a centre pivot, was sown at 20 kilograms per hectare – well above the district average – to maximise early feed production that has paid off.

The Goldstrike® seed treatment is a combination of micronutrients, Rhizobium bacteria and fungicide which Russell is sure has helped the GTL®60 Lucerne establish well, and will give the stand the best chance of long-term survival.

See page 18 for GLT®60 Lucerne product information

They took over the farm nearly two years ago, and knew that producing home-grown fodder was going to be the key element to their profitability.
Wade Alexander of Mundubbera in the North Burnett Region of Queensland operates a beef cattle and intensive lucerne hay production enterprise.

He produces high-quality hay into large square 8x4x3 bales for Feed Central to market into the feedlot and dairy sector.

Approximately 75 hectares are sown down to lucerne under centre pivot and hard hose irrigation systems, with water supplied from the Burnett River.

In 2018, Wade was awarded ‘2017-18 QLD Best Visual Appearance Lucerne Hay’ with his L56 Lucerne at the Feed Central National Hay Quality Awards.

Wade said a consistently high-quality product ensures that long-term markets are maintained.

“Hay quality is the key to my enterprise’s success, and will continue to be into the future,” he said.

After sowing the L56 Lucerne in May 2016, it has continued to produce excellent quality hay. Eight cuts per year are taken off with an average yield of 3.5 to four tonnes per hectare.

After each cut, a feed analysis test is done by Feed Central on each specific lot.

There are several reasons Wade likes L56 Lucerne, compared to some other varieties.

“High Leaf to stem ratio, fine stem, a prompt recovery after cutting is important, and disease and insect tolerance,” Wade said.

“L56 Lucerne continues to produce the quality and yield we require and will continue to be utilised in our operation.”

See page 18 for L56 Lucerne product information

Wayne Taylor and his family have been growing lucerne in the Lockyer Valley region of Southern Queensland for generations, with a reputation for producing a quality product that is highly valued and sort after.

Several years ago, after searching for a different product to Sequel to increase production while maintaining quality, Wayne decided to try Pasture Genetics L92 Lucerne.

“We wanted lucerne that yielded well all year and gave maximum bulk, but still maintained a fine stem and quality product,” said Wayne.

Consistent supply to customers was also important, which is why the Taylors wanted to stay with a highly winter-active variety.

“They have been very pleased with the results they have achieved with L92 Lucerne, thanks to its ability to maintain a very fine stem, with an excellent stem to leaf ratio.

The last few years have been particularly hard for lucerne production, and L92 Lucerne has proven its ability to maintain a higher quality product, especially under adverse conditions.

Due to the extremely dry and hot conditions through the summer of 2018-19, the Taylors have had to scale back their lucerne with a lack of available water.

Wayne said that despite the extremely dry weather, and at times struggling to keep up the water demand, L92 Lucerne hasn’t dropped its leaf or turned coarse and rank in the stem.

Wayne has been pleased with their yields, averaging around 40 small square bales to the acre, despite not having met average rainfall for the last two seasons.

See page 17 for L92 Lucerne product information

Image: Wayne Taylor with son Nick in a paddock of L92 Lucerne.
The trial was sown May 25, 2015.
Three replicates were sown for each variety.
All varieties were initially sown at 15 kilograms per hectare.
The trial was irrigated, and treated as a high production trial, aiming for six to seven cuts per year, for assessing overall forage yield.
Forage quality measurements were taken throughout spring and summer, 2016/17. Four quality measurements of freshly cut lucerne were taken prior to whole plot forage yield cuts being made.
Each cut was made 28 days following the previous cut, all varieties were cut at the same time.
The results are average of 12 samples - four cuts per variety, with three replicates of each variety per cut.

This trial assessed the standing forage quality of many commercial lucerne varieties as two-year-old lucerne stands; as well as examining other key factors – percentage of crude protein (CP) present, metabolizable energy (ME) as megajoules per kilogram (MJ/kg) of dry matter (DM), and digestibility characteristics.

The relative feed value (RFV) of each variety was calculated. The RFV is an index value that ranks feed based on the potential digestible dry matter intake.

The RFV value is calculated by comparing the digestible dry matter of the variety; using the percentage of acid detergent fibre (ADF) with the dry matter intake estimate of the variety, using the percentage of neutral detergent fibre (NDF).

The equation used for RFV calculation is as follows:

$$RFV = \frac{(88.9 - 0.779 \times ADF)}{(120 \times NDF) / 1.29}$$

The RFV does not consider the percentage of CP or other nutrient factors, but does give a good indication of the quality of the forage in regard to its value to the grazing animal in terms of digestibility, and allows for an indexed value to be used when comparing different forage quality results of a number of varieties.

Varieties such as Q31 Lucerne and Q75 Lucerne have shown their characteristic quality traits clearly in this trial; both varieties were developed to produce high quality forage.

The samples were taken from fresh cut forage prior to cutting for forage yield; there would be greater differences again if the varieties were tested after going through a mechanical hay making process, as varieties such as Q31 Lucerne and Q75 Lucerne, maintain higher RFV values due to their high leaf holding traits. A typical lucerne hay or silage feed sample would have a lower RFV rating, and lower percentage of CP and ME values than shown on this chart, as these were fresh cut pasture with very little leaf loss, compared to what would normally be, after mechanical harvesting.

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<th>CP%</th>
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<td>73.4</td>
<td>11.0</td>
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The selection of lucerne cultivars with high leaf holding capacity such as Q31 Lucerne, allows for higher relative feed value results, as demonstrated in this trial.

The ability for green cut lucerne to hold its leaf into the bale is critical when making premium quality hay. Mechanical losses at time of baling range from eight to 45 per cent. When targeting high quality lucerne hay, it is paramount to select varieties with such leaf holding traits. Q31 Lucerne demonstrates excellent leaf retention in the bale.

Left: Q31 Lucerne after baling.
Right: Replicated lucerne plots, lucerne feed quality trial.
Pasture Genetics has taken the term ‘grazing tolerant’ very seriously with its selection of new lucerne material. The ability to select plant germplasm through a five year intensive grazing trial, has proven critical to give farmers confidence in new lines coming through the Pasture Genetics lucerne breeding programme. The strength of this trialling model will be replicated in the future with more selections being made with this key grazing tolerance trait.

The trial protocol was established in conjunction with NSW DPI and IP Australia to give a measure of true grazing tolerance. After the lucerne was established it was grazed every three weeks (or when grazing was required) to a residual height of about 30 millimetres. Approximately 20 Merino wethers were used to graze the trial each time, this was the number of animals adequate to graze the trial down within at least a three to four day period so we could manage frequent grazing events but not expose the lucerne to extended periods of set stocking.

The basis of this grazing management was to make sure the lucerne was put under frequent grazing pressure, but not deliberately set stocked. In the first three year period the trial was grazed 32 times, and in the recent two year period was grazed 18 times.

Plant counts were taken initially and results have been measured based on the percentage of residual plant counts remaining after the three and five year periods.

Originally the trial was established at a dryland sowing rate of four kilograms per hectare resulting in an average starting plant count of 37 plants per metre square, which suited our target of 30 - 40 plants per metre square based on our average annual 420 millimetres rainfall.

The results shown in the graph on this page now indicate the updated results after five years of the trial period which has shown some significant differences in the performance of varieties, and quite a variation in the results that were seen after the three year period was measured, in particular some of the Highly Winter Active material has distinctly dropped off in the recent two years.

Lucerne stands are grazed to restrict flowering over a three year period to increase pressure on plants.

**Percentage of residual plants after three and five years of grazing.**
L70 v Aurora Trial

2011 | MUTLITPLE TRIAL SITES

L70 Lucerne offers higher disease and pest package compared to Aurora.

Superior forage genetics - higher leaf to stem ratio.

Minimum 90 per cent germination standards exceeds current minimum certified standard for Aurora of only 60 per cent.

L70 Lucerne seed production is derived from dryland seed production stands only. This ensures the dryland integrity and performance of L70 Lucerne is maintained when utilised in dryland grazing enterprises.

These attributes, combined with superior plant genetics, makes L70 Lucerne an excellent new alternative to Aurora.

L70 Lucerne offers producers higher returns and allows them to plant with confidence knowing they are covered by the Establishment Guarantee™ programme.

Germination Standards Comparison

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<th>COATED AURORA</th>
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<td>300,000</td>
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<td>Seeds sown/m² at 4kg/ha</td>
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<td>Minimum germination %</td>
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<td>Established rate 50%</td>
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▲ 38 per cent increase in plant establishment per square metre

Disease Rating Comparison

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LEAF TRAIT COMPARISON

L70 Lucerne (left) exhibiting higher leaf carrying trait compared to older plant genetics exhibited in Aurora (right).

YIELD RESULTS AND PRICING COMPARISON

L70 Lucerne offers very competitive pricing to Aurora and therefore similar per hectare input seed costs.

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<th>AURORA</th>
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<tr>
<td>Total yield</td>
<td>18.5 t/ha</td>
<td>17.0 t/ha</td>
</tr>
<tr>
<td>Hay returns/ha at $200t</td>
<td>$3,700/ha</td>
<td>$3,400/ha</td>
</tr>
</tbody>
</table>

▲ Extra hay returns $300 per hectare, per year

Source: Pasture Genetics, L70 Lucerne Grazing Trial, 2011, Penfield Research Station
Five years. Four irrigated sites. 46 cuts
Locations: Virginia SA, Struan SA, Forbes NSW and Wagga Wagga NSW

▲ Extra hay returns $300 per hectare, per year
“Our stock record good weight gain on L56 Lucerne thanks to its leafy nature, and superior tolerance to grazing and insects. It’s also very persistent – the density of the stand hasn’t really changed that much since we sowed it six years ago.”

MARK VANDELEUR
RICES CREEK POLL MERINOS
TINTINARA, SA
Live Weight Gain Trial 2014

Throughout the duration of the trial, all varieties were exposed to the same environmental conditions and assessed equally by being grazed simultaneously by three grazing groups of steers; one group on each variety at any time. With each cattle group grazing each different variety for a four week rotation, this allowed us to exclude the differences in the grazing performance of the different cattle groups from being a variable factor.

An irrigated six hectare paddock paddock was divided into 12 half-hectare sections. On the May 23, four of these sections were each sown with L71 Lucerne, Aurora, and SARDI 7 Series 2.

Sowing rate was 15 kilograms per hectare.

24 Hereford steers were split into three grazing groups of eight steers, with an average starting weight of 299 kilograms.

The three groups simultaneously grazed each of the varieties throughout the duration of the trial.

The trial ran for 12 weeks, in which each variety at least would be grazed for a four week duration by each of the four grazing groups.

No other sources of feed or supplements were given to the animals.

DISCUSSION

Throughout the duration of the trial, all varieties were exposed to the same environmental conditions and assessed equally by being grazed simultaneously by the three grazing groups of steers; one group on each variety at any time. With each cattle group grazing each different variety for a four week rotation, this allowed us to exclude the differences in the grazing performance of the different cattle groups from being a variable factor.

The trial focused on the true variable being the variety of lucerne that was being grazed. During the trial measurements on dry matter production of the varieties were also taken, as well as samples taken for feed quality analysis. All varieties established well, and the cattle performance in the first four week rotation was good all round. Prior to the trial commencing there was a very dry early spring period, without much natural rainfall. The trial was irrigated, but there was still a lack of soil moisture deep in the soil profile and this caused some periods of moisture stress between watering.

This resulted in particularly the second rotation showing a drop off in dry matter production from all varieties, but also daily weight gain in the Aurora and SARDI 7 Series 2. However, dry matter production and weight gain began to increase again in the third rotation across all varieties.

The results indicate that the L71 Lucerne was able to maintain quality and resulted in higher levels of intake during these times. The feed analysis shows a lower percentage of ADL and NDF values, this could likely account for the higher levels of kilograms per day weight gain achieved by the L71 Lucerne throughout the trial. The results are consistent with the key features of L71 Lucerne; which is a highly persistent and high quality variety, able to perform in both irrigated and dryland conditions that are less than ideal.
Many older lucerne stands suffer from thinning and lack of winter feed. The following trial assessed seven different species with known excellent winter forage production oversown into a thinning lucerne stand to see which could provide a solution to both problems.

- A small block of ML99 MultiLeaf® Lucerne was sown at 15 kilograms per hectare on September 14, 2011 to be a grazing block for sheep.
- The block was winter cleaned each year, and grazed frequently for three and a half years, resulting in significant thinning of the stand.
- After a heavy grazing event, sheep were removed in early May 2015, and then an early winter clean with Sprayseed was applied around May 15.
- On May 25, the block was oversown using a disc seeder with seven different winter active forages in two replications.
- The varieties trialled were: Ryecorn, Moby Forage Barley, Outback Forage Oats, Jivet Tetraploid Annual Italian Ryegrass, Icon Diploid Italian Ryegrass, Perun Tetraploid Festulolium and Cavalier Spineless Burr Medic.
- The forage cereals were sown at 50 kilograms per hectare, the grasses at 15 kilograms per hectare, and the medic was sown at 10 kilograms per hectare.
- After eight weeks the trial was grazed, as well as three other grazing events throughout the late winter and spring; each grazing event consisted of three days of hard grazing to achieve a very low residual, following by up to four weeks of recovery time.
- Dry matter production was measured prior to each grazing.

**DISCUSSION**

The practice of oversowing thinning lucerne stands with a winter forage is a good way to get some continued life out of the stand, as well as attempt to compete and control winter weeds during a problem time of the year for weed control in lucerne. All species in the trial were chosen for their strong winter growth and establishment vigour. A lighter sowing rate than normal in these species was used to oversow the lucerne. All the varieties in the trial were compared in dry matter production to a section of lucerne that had no winter forage sown. This allowed for the additional dry matter production from the winter forages to be adequately compared with what lucerne would have achieved by itself. The highest dry matter production during the trial was from the Moby Forage Barley, the vigorous early growth of Moby Forage Barley had the barley well established before the first grazing, as well as being able to recover from that grazing quickly.

The ryecorn was also quick to establish, but the Outback Forage Oats did not fare well from a later sowing, ideally the Outback Forage Oats needed longer to establish or needed to be sown earlier in the year in better conditions.

The forage cereals however all began to suffer from their short season nature, and before the third and final grazing most of the Moby Forage Barley and ryecorn was out to head, and looked to recover very poorly from grazing. The Jivet Tetraploid Annual Italian Ryegrass and Icon Diploid Italian Ryegrass both produced reasonably well but were a little behind the cereals in the early cuts, however both of these varieties started to produce more dry matter than the cereals in the final cut. If the trial continued, the Jivet Tetraploid Annual Italian Ryegrass and Icon Diploid Italian Ryegrass could have at least had another grazing or two and recovered well, unlike the forage cereals which were well past their prime. The Perun Tetraploid Festulolium did poorly in comparison to the other grass species and this is probably due to the original sowing time of the trial.

Perun Tetraploid Festulolium needs to be sown at the earlier end of the sowing window in Autumn or it can be sluggish and in this trial situation where the winter forages were sown quite late in the window it did not perform well in this trial. The Cavalier Spineless Burr Medic was the least successful variety in the trial, and this is probably due to the management. Eight weeks was much too early for grazing the Cavalier Spineless Burr Medic, and the variety never recovered well after the first grazing.

If the Cavalier Spineless Burr Medic was managed correctly, the ideal situation would be to let the Cavalier Spineless Burr Medic establish well, then graze it only a few times, and finally let it seed down for following years of production, however in this trial it never had a chance to seed and was only assessed as an annual. Feed quality tests were also taken throughout the trial of the mix of winter forage and lucerne, and the results indicate that all of the material from the winter forages was very high quality.

The lucerne component resulted in all the mixed pasture having very high levels of Crude Protein, good levels of ME and also low levels of ADF and NDF across all species.

All of the species in this trial could be used in high performance pasture situations to improve winter production of a lucerne stand while maintaining elite levels of animal production.
## TRIAL RESULTS

<table>
<thead>
<tr>
<th></th>
<th>Ryecorn</th>
<th>Moby</th>
<th>Outback</th>
<th>Jivet</th>
<th>Icon</th>
<th>Perun</th>
<th>Cavalier</th>
<th>Lucerne</th>
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<tbody>
<tr>
<td>1st Cut – 07/08/2015</td>
<td>3.1</td>
<td>3.4</td>
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<td>3.0</td>
<td>2.8</td>
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<td>1.3</td>
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<td>3rd Cut – 02/10/2015</td>
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<td>3.8</td>
<td>2.4</td>
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<td>2.9</td>
<td>2.4</td>
<td>1.9</td>
<td>1.5</td>
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<tr>
<td>4th Cut – 30/10/2015</td>
<td>2.9</td>
<td>3</td>
<td>2.7</td>
<td>3.2</td>
<td>3.2</td>
<td>2.7</td>
<td>2.7</td>
<td>2</td>
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<tr>
<td>Total</td>
<td>12.5</td>
<td>13.4</td>
<td>10.3</td>
<td>11.3</td>
<td>11.4</td>
<td>10.3</td>
<td>9.4</td>
<td>6.4</td>
</tr>
<tr>
<td>Additional Total</td>
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<td>7.0</td>
<td>3.9</td>
<td>4.9</td>
<td>5.0</td>
<td>3.9</td>
<td>3.0</td>
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Results from feed test taken prior to first grazing

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<th>Meas.</th>
<th>Ryecorn</th>
<th>Moby</th>
<th>Outback</th>
<th>Jivet</th>
<th>Icon</th>
<th>Perun</th>
<th>Cavalier</th>
<th>Lucerne</th>
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</thead>
<tbody>
<tr>
<td>ME (MJ/kg)</td>
<td>11.2</td>
<td>11.8</td>
<td>11.85</td>
<td>11.2</td>
<td>11.3</td>
<td>10.85</td>
<td>9.95</td>
<td>10.85</td>
</tr>
<tr>
<td>% Crude Protein</td>
<td>27.7</td>
<td>25</td>
<td>24.35</td>
<td>27.9</td>
<td>25.6</td>
<td>25.6</td>
<td>28.25</td>
<td>29.95</td>
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<tr>
<td>% ADF</td>
<td>21.8</td>
<td>20.9</td>
<td>19.15</td>
<td>19.05</td>
<td>18.15</td>
<td>19.75</td>
<td>21.9</td>
<td>21.3</td>
</tr>
<tr>
<td>% NDF</td>
<td>37.15</td>
<td>39.5</td>
<td>37.8</td>
<td>35.35</td>
<td>35.6</td>
<td>39</td>
<td>37.15</td>
<td>32.45</td>
</tr>
<tr>
<td>% Digestibility (DMD)</td>
<td>74.55</td>
<td>78</td>
<td>78.35</td>
<td>74.55</td>
<td>75.1</td>
<td>72.7</td>
<td>67.25</td>
<td>72.4</td>
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</table>

<table>
<thead>
<tr>
<th>Before sowing</th>
<th>Eight weeks after sowing</th>
<th>Residual after first grazing</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Before sowing" /></td>
<td><img src="image2" alt="Eight weeks after sowing" /></td>
<td><img src="image3" alt="Residual after first grazing" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ryecorn</th>
<th>Jivet</th>
<th>Outback</th>
<th>Cavalier</th>
<th>Moby</th>
<th>Perun</th>
<th>Icon</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image4" alt="Ryecorn" /></td>
<td><img src="image5" alt="Jivet" /></td>
<td><img src="image6" alt="Outback" /></td>
<td><img src="image7" alt="Cavalier" /></td>
<td><img src="image8" alt="Moby" /></td>
<td><img src="image9" alt="Perun" /></td>
<td><img src="image10" alt="Icon" /></td>
</tr>
</tbody>
</table>
Live Weight Gain Trial 2016

2016 | PENFIELD RESEARCH STATION | TRIAL SOWN 05/08/2016

- An irrigated six hectare paddock was divided into 12 half-hectare sections. On August 5, four of these sections were each sown with L92 Lucerne, Sequel and SARDI 10 Series 2.
- Sowing rate was kilograms per hectare.
- 24 Santa Gertrudis steers were split into three grazing groups of eight steers, with an average starting weight of 325 kilograms.
- The three groups simultaneously grazed each of the varieties throughout the duration of the trial.
- The trial ran for 12 weeks, in which each variety at least would be grazed for a four week duration by each group of cattle.
- No other sources of feed or supplements were given to the animals.

DISCUSSION

The trial protocol dictated that all three varieties would be grazed equally by each cattle group. Also all of the varieties would be simultaneously grazed by the three cattle groups. Throughout the 12 week period, each group of cattle spent four weeks on each variety, with the three groups moving through the paddock on a different variety each. Each cattle group was weighed initially and then weighed again after spending four weeks on a variety. Over the 12 week period all three lucerne varieties were exposed to the same grazing conditions and all cattle groups had grazed each lucerne variety equally.

By running the trial this way, the only changing variable throughout the 12 week period is which of the lucerne varieties that the cattle would be grazing, eliminating other factors that might influence the weight gain results.

Conditions were favourable for establishment in the middle of August and as soon as the lucerne was established enough to be grazed the cattle were sent in. The first four week grazing period showed quite similar results to between the three varieties. As the trial progressed however the both the L92 Lucerne and SARDI 10 Series 2 both exceeded the Sequel in dry matter production per day as well as live weight gain increase per day. There was significant summer rainfall throughout the trial period and high temperatures and the lucerne thrived. It was the improved varieties that maximised this natural rainfall however and performed much better than the Sequel in terms of both overall dry matter production as well as resulting live weight gain on the cattle. With better growth and regrowth from the L92 Lucerne compared with the Sequel, the result was also better quality feed in terms of digestibility and in the last two grazing rotations the L92 Lucerne showed improved weight gain alongside the improved forage production where the Sequel did not increase its rate of weight gain.

**Feed Tests**

<table>
<thead>
<tr>
<th></th>
<th>L92</th>
<th>Sequel</th>
<th>SARDI 10 Series 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME (MJ/kg)</td>
<td>11.20</td>
<td>11.10</td>
<td>11.40</td>
</tr>
<tr>
<td>% Crude Protein</td>
<td>26.70</td>
<td>26.10</td>
<td>26.10</td>
</tr>
<tr>
<td>% ADF</td>
<td>21.3</td>
<td>27.3</td>
<td>21.8</td>
</tr>
<tr>
<td>% NDF</td>
<td>31.7</td>
<td>33.8</td>
<td>32.2</td>
</tr>
<tr>
<td>RFV</td>
<td>212.4</td>
<td>186.1</td>
<td>207.5</td>
</tr>
</tbody>
</table>

Average results from feed test taken prior to grazing throughout the trial (three tests).
PASTURES Lucerne Update 2019

Pests and Diseases

PHYTOPHTHORA ROOT ROT – PHYTOPHTHORA MEDICAGINIS

DESCRIPTION: Plants turn yellow, wilt and die. Areas of light brown discolouration up to five centimetres long occur on the taproot up to 30 centimetres below the crown. The taproot below the discoloured area will rot away completely.

INCIDENCE: Occurs throughout Australia, particularly in heavy and/or poorly drained soils, and in wet conditions. The disease can be severe, killing large numbers of seedlings or scattered plants or large patches in mature seeds. In irrigated stands plants can survive. The taproots immediately below the crown is kept alive by the availability of water but forage yields are reduced.

SPREAD: The fungus spreads rapidly in water over considerable distances.

MANAGEMENT: Use resistant varieties and spell the paddock from lucerne. Do not rotate with chickpeas. Avoid waterlogging irrigated stands on heavy soils.

COLLETOTRICHUM CROWN ROT OR STEM ANTHRACNOSE – COLLETOTICHUM TRIFOLII

DESCRIPTION: Brown-black spots on the stems develop into well defined boat shaped lesions that are up to 25 millimetres long, dark around the edges with pale centres, and covered in raised dark spots. The fungus can also enter the crown causing a blue-black discolouration, five to eight centimetres into the taproot. In mature stands, the dead stems are white or straw coloured with a sheppard’s crook appearance. Plant death occurs gradually.

INCIDENCE: Occur throughout Australia in warm environments with high humidity. It is more severe during late summer to autumn. It is less likely in drier and cooler climates.

SPREAD: Spores spread in warm, wet weather from plant debris and from the crown of infected plants by raindrop splash and harvesting equipment.

MANAGEMENT: Use disease resistant varieties and, if crown rot and anthracnose have been severe, rotate the crop every three years with non-host plants.

SPOTTED ALFALFA APHID (SAA) – THERIOAPHIS TRIFOLII

DESCRIPTION: Adults are pale yellowish-green, two millimetres long, with six or more rows of black spots along their backs. Adults may have wings. Nymphs are smaller and wingless.

DAMAGE: Adults and nymphs suck sap from the stems or the undersides of lower leaves. SAA inject a toxin that can kill seedlings and mature plants. Prior to that, leaf veins become yellow or white and the leaves curl and drop off. Honeydew excreted by SAA causes foliage to become sticky and develop a black, sooty mould.

INCIDENCE: Occur throughout Australia in dry conditions, mainly in the spring and autumn.

MANAGEMENT: Plant resistant varieties. Monitor beneficial insects. Irrigate or graze the stand to reduce SAA numbers. In irrigated hay stands, use insecticides if the infestation is heavy.

BLUEGREEN APHID (BGA) – ACYRTOSIPHON KONDIO

DESCRIPTION: Adults vary from pale green-grey to dark green-blue and are three millimetres long and have tube-like projections on either side at the rear of their bodies. Adults may have wings. Nymphs are smaller and wingless.

DAMAGE: Adults and nymphs suck sap from the leaves and stems at the growing points, causing shortened internodes between the leaves at the top of each stem, stunted plants, leaf curling and leaf yellowing. Honeydew excreted by BGA make the foliage sticky and affects hay and pasture quality. BGA do not kill mature plants.

INCIDENCE: Occur throughout Australia and most active during the cooler months, particularly dry conditions.

MANAGEMENT: Plant resistant varieties. Monitor beneficial insects. Irrigate or graze the stand to reduce BGA numbers. In irrigated hay stands, use insecticides if the infestation is heavy.
PEA APHID (PA) – ACYRTHOSIPHON PISOM

DESCRIPTION: Green in colour, though some may be yellow or pink. They are four to five millimetres long with dark bands around the antennae and spine-like projections on both sides at the rear of their bodies. Adults may have wings. Nymphs are smaller and wingless.

DAMAGE: PA suck sap from the leaves causing wilting, stunting and curling, and odd-shaped plants. The top leaves often turn light green while the lower turn yellow and die. Honeydew excreted by PA makes foliage sticky, affecting hay and pasture quality. PA is a significant carrier of alfalfa mosaic virus.

INCIDENCE: Common in southern Australia, Western Australia and New South Wales during dry conditions in spring and autumn, although economic levels of damage are rare.

MANAGEMENT: Monitor beneficial insects. Irrigate or graze the stand to reduce PA numbers. In irrigated hay stands, use insecticides if the infestation is heavy.

STEM NEMATODE – DITYLENCHUS DIPSACI

DESCRIPTION: Microscopic eel-worms that are individually difficult to see with the naked eye. Sometimes they mass on or just below the surface to form visible “eel-worm wool”. These can survive desiccation and be transported in hay to start new infestations.

DAMAGE: Plants are dwarfed and distorted, with swollen shoots. Leaves are distorted and clustered towards the ends of stems. Plants die in patches.

INCIDENCE: Occur in southern Australia, common in irrigated stands on river flats, with greatest severity in the spring.

MANAGEMENT: Sow resistant varieties, plough out badly infested stands and practice crop rotation.

BACTERIAL WILT – CLAVIBACTER MICHIGANENSE SSP.INSIDIOSUS

DESCRIPTION: Yellow and stunted plants with small leaves are scattered through the stand. The inner bark of the taproot is white while the exposed root centre is yellowish.

INCIDENCE: Common in southern Australia, but has not been reported in the southeast of South Australia. It often occurs in autumn in irrigated stands. It is not found in the dry, inland sub tropics of Queensland and northern New South Wales.

SPREAD: The bacteria persist in soil for more than 10 years. The disease is spread by stem nematodes and through hay and machinery.

MANAGEMENT: Sow certified seed of resistant varieties.

FUSARIUM WILT – FUSARIUM OXYSPORUM F.SP.MEDICAGINIS

DESCRIPTION: Initially, plants are stunted with wilted shoots and yellow leaves. The infection then bleaches the leaves and stems, eventually causing plant death. Dark red-brown streaks develop in a layer under the bark at the base of the stem forming a reddish-brown ring in the centre of the root.

INCIDENCE: Fusarium wilt is not common. The Fusarium fungus is widespread, but rarely causes wilt. Fusarium wilt has not been identified in New South Wales.

SPREAD: The fungus survives for long periods in decaying plants. It invades small roots or wounds in the taproot during warm, wet weather.

MANAGEMENT: Controlled by crop rotation and resistant varieties.
### Measuring the resistance of major pests

<table>
<thead>
<tr>
<th>Resistance level</th>
<th>High Resistance</th>
<th>Resistance</th>
<th>Moderate Resistance</th>
<th>Low Resistance</th>
<th>Susceptible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant Resistance</td>
<td>&gt; 50%</td>
<td>31 - 50%</td>
<td>15 - 30%</td>
<td>7 - 14%</td>
<td>0 - 6%</td>
</tr>
</tbody>
</table>

### Multiple pest and disease resistance chart

Pasture Genetics lucerne varieties stand out in the Australian marketplace with superior pest and disease ratings. L56 Lucerne has the highest resistance to Phytophthora Root Rot available and is the only variety to have high resistance to each of the nine significant pests and diseases listed in the multiple pest and disease chart below.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Winter Activity</th>
<th>Spotted Alfalfa Aphid</th>
<th>Blue Green Aphid</th>
<th>Pea Aphid</th>
<th>Phytophthora Root Rot</th>
<th>Anthracnose</th>
<th>Bacterial Wilt</th>
<th>Fusarium Wilt</th>
<th>Stem Nematode</th>
<th>Root Knot Nematode</th>
</tr>
</thead>
<tbody>
<tr>
<td>ML99 MultiLeaf® Lucerne</td>
<td>10 HR</td>
<td>HR</td>
<td>ND</td>
<td>HR</td>
<td>HR</td>
<td>ND</td>
<td>ND</td>
<td>MR</td>
<td>HR</td>
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</tr>
<tr>
<td>Sardi 10</td>
<td>10 HR</td>
<td>HR</td>
<td>ND</td>
<td>R</td>
<td>R</td>
<td>ND</td>
<td>ND</td>
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<td>L92 Lucerne</td>
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<td>ND</td>
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<td>R</td>
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<td>R</td>
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<td>ND</td>
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<td>ND</td>
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<tr>
<td>Pegasus</td>
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<td>MR</td>
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<td>L70 Lucerne</td>
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<td>Aurora</td>
<td>6 HR</td>
<td>HR</td>
<td>ND</td>
<td>R</td>
<td>MR</td>
<td>LR</td>
<td>ND</td>
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<td>GTL®60 Lucerne</td>
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<td>ND</td>
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<td>HR</td>
<td>ND</td>
<td>R</td>
<td>ND</td>
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<tr>
<td>Stamina - GT6</td>
<td>6 HR</td>
<td>R</td>
<td>HR</td>
<td>R</td>
<td>HR</td>
<td>ND</td>
<td>ND</td>
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<td>ND</td>
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<td>Hunterfield</td>
<td>6 HR</td>
<td>HR</td>
<td>ND</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>ND</td>
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<td>L56 Lucerne</td>
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<td>HR</td>
<td>HR</td>
<td>HR+</td>
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<td>HR</td>
<td>HR</td>
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<td>SARDI 5</td>
<td>5 HR</td>
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<td>ND</td>
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<td>Venus</td>
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<td>ND</td>
<td>MR</td>
<td>LR</td>
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<td>ND</td>
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<td>Kaituna</td>
<td>5 R</td>
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<td>Q31 Lucerne</td>
<td>3 R</td>
<td>MR</td>
<td>MR</td>
<td>HR</td>
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<td>R</td>
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### Chemical Options

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Pre-sowing</th>
<th>Post emergent, seedling and established lucerne</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Trifluralin Triflura®</td>
<td>Fusilade®, Select®, Broadstrike™, Spinnaker®, Raptor®, Bromoxynil Bromicide 200®, Jaguar®, Buttress®</td>
</tr>
<tr>
<td></td>
<td>A (Pop’s)</td>
<td>A (Dims)</td>
</tr>
</tbody>
</table>

**Grass weeds**

- Ryegrass: Suppression
- Barley Grass: Suppression
- Brome Grass: Suppression
- Wild Oats: Suppression
- Silver Grass: Suppression

**BROADLEAF WEEDS**

- Capeweed: Suppression
- Wild Radish: Suppression
- Wireweed: Suppression
- Wild Mustard: Suppression
- Wild Turnip: Suppression
- Doublegee: Suppression

**Crop Stage**

<table>
<thead>
<tr>
<th>Weed Stage</th>
<th>PS</th>
<th>1st Leaf</th>
<th>2nd Leaf</th>
<th>1st Leaf</th>
<th>2nd Leaf</th>
<th>1st Leaf</th>
<th>3rd Leaf</th>
<th>2 to 6 Leaf</th>
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<tbody>
<tr>
<td>PE</td>
<td>-</td>
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<td>-</td>
<td>-</td>
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**Established lucerne only**

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Broadstrike™ Broadsword®</th>
<th>Diuron - Diurex®</th>
<th>Simazine - Gesatop®</th>
<th>Spray.Seed Revolve®</th>
<th>Paraquat - Gramoxone®</th>
<th>Sharpen®</th>
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<tbody>
<tr>
<td></td>
<td>B</td>
<td>C</td>
<td>C</td>
<td>L</td>
<td>L</td>
<td>G</td>
</tr>
</tbody>
</table>

**Grass weeds**

- Ryegrass: -
- Barley Grass: -
- Brome Grass: -
- Wild Oats: -
- Silver Grass: -

**Broadleaf Weeds**

- Capeweed: Suppression
- Wild Radish: Suppression
- Wireweed: Suppression
- Wild Mustard: -
- Wild Turnip: -
- Doublegee: Suppression

**Crop Stage**

- At least one year old

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Sharpen may impact activity of Paraquat - Gramoxone® on grasses.

Broadstrike™ herbicide will control Capeweed, Wild radish, Wireweed and Doublegee/Spiny emex when used in conjunction with a mixing partner.

A: Aryloxyphonoxypropionates, Cyclohexanediones
B: Imidazolinones
C: Nitrates, Urea, Triazines
D: Dinitroanilines, Benzoic acids, Pyridines
F: Nicotinamides
L: Bipyridles

Herbicides for weed control in lucerne as indicated by shading.

**Before using any herbicide consult your agronomist and the product label regarding safe and effective use**

Table adapted from The Back Pocket Guide WA.
“Usually we would expect five to six years from a hay paddock, but I don’t see the point in taking this out yet. We are looking at 6,000 bales again this year and might just push the record.”

DAVID BARKER
VIRGINIA, SA