

**Heritage**seeds 



# **LUCERNE** **PRODUCTION** **GUIDE**

# HERITAGE SEEDS-SARDI BREEDING PROGRAM

The South Australian Research and Development Institute (SARDI) manages the largest and longest running lucerne breeding program in the country. It is at the forefront of developing new Australian-bred varieties for Australian conditions.

Heritage Seeds has a long proud history with the initiative and has been an important part of its success. Since 1992, Heritage Seeds has worked closely with SARDI to help ensure new varieties are developed based on market requirements so only the best are chosen for commercial release. Following the withdrawal of the NSW DPI from lucerne breeding, SARDI is the only program with the resources and ability to deliver the most widely adaptable and thoroughly tested lucerne varieties in Australia.

SARDI's industry-leading research and development facilities are like no other. Every year, over 50 new lines are tested using a network of up to 40 locations. After 6–7 years of continuous trialling in harsh, real farm situations, the best of these lines are selected from the field and subjected to intensive disease and pest resistance screening, before being incorporated into a new variety.

Crucial to the success of a lucerne cultivar is choosing one that has been developed for the unique Australian environment. Many other varieties are bred overseas where environmental conditions, pests, disease strains and management practices are very different. While some are subjected to localised trialling, many have limited if any testing in this country.

The years of commitment by both SARDI and Heritage Seeds has resulted in the collection of an extensive pool of outstanding lucerne genetics with an inherent toughness and field tolerance. These varieties are uniquely placed and broadly adaptable offering proven performance, grazing persistence and pest and disease resistance making them the number one choice for Australian farmers.

**The Heritage Seeds-SARDI breeding program produces lucerne varieties that can offer:**

- A range of winter activity and dormancy
- Superior yield and after-cutting growth
- Resistance to lucerne pests and diseases
- Adaptability to varying climates and soil types
- High forage quality
- Persistence under extreme grazing management
- Suitability for mixed farm situations.





Forage yield evaluation trial at Howlong, NSW

# CONTENTS

|  |    |
|--|----|
| HERITAGE SEEDS-SARDI Breeding Program                                      | 2  |
| Lucerne Research Update  | 4  |
| Agronomy Notes to Aid Preparation, Establishment and Management of Lucerne | 5  |
| Dormancy Groups  | 5  |
| Sowing Rates   | 5  |
| Seed Coating   | 6  |
| Establishment  | 6  |
| Fertility  | 6  |
| Increasing Plant Numbers in a Thin Stand                                   | 6  |
| Weed Control   | 6  |
| Pests  | 7  |
| As a Pasture Mix   | 7  |
| Undersowing In Cereals   | 7  |
| Cutting  | 7  |
| Nutrition and Fertiliser   | 8  |
| Grazing  | 8  |
| Terminating a Lucerne Stand  | 8  |
| Lucerne Varieties  | 9  |
| SARDI-Grazer   | 9  |
| SARDI 7 Series 2   | 10 |
| Genesis II   | 10 |
| SARDI 10 Series 2  | 11 |
| SARDI 5  | 11 |
| Lucerne Product Adaption Chart   | 12 |
| Lucerne Ready Reckoners  | 14 |

# LUCERNE RESEARCH UPDATE

## Heritage Seeds-SARDI/MLA Acid Tolerance Lucerne Project

Heritage Seeds, in partnership with SARDI, are proudly developing a unique lucerne variety in SARDI AT7.

SARDI AT7 has been developed over seven years of breeding and initial trialling, with many stringent cycles of selection in the field and the glasshouse. It is an exciting development which has the potential to tolerate soils with higher Aluminium ( $Al^{3+}$ ) levels and lower pH than other available varieties.

Heritage Seeds and SARDI are currently running a project in conjunction with MLA to help determine what the true benefits of SARDI AT7 will be for the farmer. The intensive project involves a total of four sites with two in South Australia (Pewsey Vale & Tooperang), one in Victoria (Boralma) and one in New South Wales (Holbrook). The sites were specifically chosen for their elevated  $Al^{3+}$  levels (up to 23%) as well as their low pH (as low as 4.3  $CaCl_2$ ).

These soils represent millions of hectares of country which otherwise would be unsuitable for lucerne. Each site has a number of trials which will run for two years each. The results that are gathered are very detailed and collected using strict protocols for increased accuracy and certainty.

The trials are looking at how SARDI AT7 performs in comparison to a contemporary standard lucerne variety in terms of dry matter production, plant persistence, nodulation and nitrogen fixation in such challenging soils. A liming-rate trial will also show how the results change with varying rates of lime and pH. This will help determine  $Al^{3+}$  thresholds SARDI AT7 can handle and remain productive. At the same time it will assist in the development of some guidelines for what  $Al^{3+}$ % and pH levels are suitable and unsuitable for SARDI AT7 .

Whilst it is expected that SARDI AT7 will have application for regions with elevated  $Al^{3+}$ , it will also offer an opportunity to provide more uniform performance over locations with varying soils types and fertility, thus potentially improving overall production in what may be often regarded as marginal lucerne country. It will also perform very well in soils suitable for standard lucerne varieties. We are currently half way through the life of the project so the complete data has not yet been collected, although our initial results from all sites and trials are very promising.



# AGRONOMY NOTES

## TO AID PREPARATION, ESTABLISHMENT AND MANAGEMENT.

Lucerne is a highly productive perennial plant that will generally out-yield most other pasture species in light-medium soils in dry environments. It provides excellent, palatable, nutritious feed, and should be a strong consideration where site factors and management provides the opportunity for production.

Lucerne is deep rooted, very drought hardy and provides benefits such as high animal performance, nitrogen fixation (for itself and subsequent crops), and offers an opportunity for a productive break crop or long-term pasture, that may also aid the management of weedy grass species.

### Dormancy groups

There are three main dormancy groupings for lucerne. The ratings are based on how much growth the variety produces in the winter months (all dormancy groups grow actively in summer if moisture is available). The suitability for purpose of each is largely dependent upon its dormancy rating:

| Dormancy  | Winter Activity Rating | Life Expectancy   | Suitability                                      |
|---|------------------------|-------------------|--|
| Winter dormant (SARDI 5)                                    | 4 to 5                 | 8 years plus      | Grazing and fine cut hay                         |
| Winter active (SARDI 7 Series 2, SARDI-Grazer & Genesis II) | 6 to 7                 | 5 to 8 years plus | Grazing/hay, general purpose                     |
| Highly winter active (SARDI 10 Series 2)                    | 8 to 10                | 3 to 4 years plus | Winter feed, hay production, short pasture phase |

Varieties with a dormancy rating of 1–6 are only suitable for early autumn or spring sowing. Those with a rating of 7–10, are suitable for later autumn sowing under most circumstances. Lucerne with dormancy rating <4 are sometimes considered for low-stock density, extensive systems, however they are infrequently used due to lower overall productivity when compared to contemporary 5–10 rated varieties.

The annual growth of winter dormant lucerne tapers off earlier as the season cools in autumn, but will often start producing again earlier in the following spring – approximately 90% to 95% of production occurs during September to March. For winter active varieties 70% to 75% of production occurs during September to March.

Maximum production of a lucerne stand is in years 1 to 6, and then tapers off unless very well maintained.

### Sowing rates

Sowing rates for lucerne depend mostly on available moisture (rain or irrigation):

| Rain   | Kg/ha | Plant counts/m <sup>2</sup> (after 1st summer) |
|--|-------|--|
| Marginal Dryland (350–450mm)                 | 4–6   | 15–40  |
| Dryland (450–600mm)                          | 6–8   | 50–70  |
| Favourable Dryland (600–800mm)               | 10–12 | 80–100   |
| High Rainfall/Irrigated (800mm+ / Irrigated) | 15–25 | 130–150  |

Note: The sowing rate is determined by the soil type. On heavier soils use the higher end of the rate range.

Thicker sowing gives thinner stems – can be used for irrigated hay production as a tool. Allow for germination % and an establishment factor of 65–75%.

## Seed coating

It is recommended to use a coated seed that includes the correct inoculants and an insecticide for early protection from red legged earth mites (RLEM) and lucerne flea. With sensible storage, AgriCote seed coating will last for six months and will be useful for up to 12 months or longer.

Seed coating will decrease the seed count from approximately 400,000/kg to 330,000/kg, but this should not affect the sowing rate as establishment should be higher due to the benefits and protection afforded by the seed coating.

## Establishment

The ideal soil temperature for establishing lucerne is 12°C and rising. Lucerne seed is small so ensure to sow close to the surface at approximately 10–15mm deep. It is also important that there is enough soil moisture to support germination. Roll lightly if the soil is fluffy.

For spring-sown dryland crops, sow late August – early October (target the earlier end of the range in regions with higher temperatures and shorter springs). In mild summer areas with irrigation, lucerne can be sown right through spring and summer. In hot summer areas, lucerne is best sown through autumn. Direct drilling or full cultivation are both suitable.

Young lucerne plants are fairly sensitive to frosts however once established, plants can survive temperatures below zero Celsius.

## Fertility

It is important to test the soil for phosphorus, potassium, aluminium and calcium. Lime is also critical to adjust soil pH, so ensure to conduct a soil test to check to see if it is needed. A pH (CaCl<sub>2</sub>) should be > 5.7, ideally > 6.0. Aluminium at depth should also be considered and paddock avoided if judged potentially problematic. A lower pH with low Al<sup>3+</sup> (<5%) may still be a suitable site however.

Sow with low nitrogen, good phosphorus and possibly potassium fertiliser. Molybdenum and Boron

should be considered where soils are typically low or application has not occurred for some years. A small amount of nitrogen may be needed until plants are established, but excessive nitrogen at sowing can have a negative impact on rhizobia infection/nodulation of the lucerne roots.

## Increasing plant numbers in a thin stand

After a lucerne stand has been established for a year or two, there usually tends to be an accumulation of toxins in the soil from plant litter and trash. This process of autotoxicity from the exudates of decaying plant material can prevent the establishment or recruitment of new lucerne seedlings. If required, re-sowing is best attempted in autumn due to competition from the existing crop in spring growth.

Usually, however the best plan is to start again as there is likely a disease, pest or nutrition problem which has led to low plant numbers. Alternatively, a thinning stand can be over sown with an alternative species to complement production and give extended life and performance. Examples are given in a following table on page 15.

## Weed control

A lucerne crop needs to be well managed to out compete weeds and produce high yields for hay and or grazing. Any problems should be identified and rectified promptly.

### Key times for weed control are:

#### PREPARATION PHASE

Weed control in prior crops or pastures.

#### PRE-PLANTING

A pre-emergent program, well executed will aid a good start.

#### POST-EMERGENCE

Monitor for weeds and address early competition earlier rather than later.

#### ANNUAL MAINTENANCE

A winter clean program is usually very effective. Spring/summer weeds may need attention under some circumstances.

**For specific herbicide and rate advice contact your local Heritage Seeds territory manager.**

Possible weed control spray options:

| Pre-planting   | First year – post-emergence   | Second and subsequent years   |
|--|---|---|
| <p>Knock down spray to remove actively growing weeds.</p> <p>Trifluralin should be used to curtail early weed competition; at rates depending on soil type.</p> <p>Pendimethalin can also be used.</p> | <p>The following options can be used up to the 8th leaf stage.</p> <p>1st trifoliolate leaf – 2,4-DB, bromoxynil</p> <p>2nd trifoliolate leaf – Flumetsolum, Imazamox, Imazethapyr</p> <p>3rd trifoliolate leaf – Bromoxynil, + diflufenican, prometryn</p> | <p>Spray-seed + Diuron (take some care with the winter active varieties)</p> <p>Simazine (may be a better option for winter actives)</p> <p>Options as per 1st year, but check for weed size and rates vary.</p> <p>Group A grass herbicides.</p> |

Pests

A lucerne crop takes a year to fully establish and a young lucerne crop needs to be monitored for pests. Using resistant varieties and coated seed should be strongly considered. Always check for red legged earth mites (RLEM) and use bare earth insecticide controls such as omethoate or bifenthrin for a longer term effect. Slugs and snails should be baited appropriately.

Once established, lucerne may be afflicted by a number of pests including mites, lucerne flea, aphids, cockchafers, armyworm and in some environments slugs. Monitoring and swift treatment should be adopted to help assure productivity and feed quality.

As a pasture mix

When sowing lucerne in southern regions as a pasture mix, establish it with a low vigour grass such as a winter active fescue, phalaris or a winter cocksfoot. It may be better to establish the lucerne first and introduce the companion varieties a season or two later, especially for producers unfamiliar with lucerne management.

For northern regions it is best to sow lucerne and grass at the same time.

Undersowing in cereals

Whilst it is not considered best practice, if undersowing lucerne with a cereal grain crop, cut the cereal rate back to 35–40% to ensure a good lucerne stand is maintained. Expect lower cereal yields as a consequence. In these instances, 2,4-DB is a good herbicide option amongst others.

Cutting

Cutting lucerne needs to be done at or a bit before 10% flowering, but note the height of new shoots at the base of the crop, and ensure that they are not damaged as they will be the next crop (best method of assessing cutting timing). Conditioner rollers are useful for quick drying. Double conditioning has been used. Re-cutting depends on seasonality, climate, and dormancy.

| Dormancy             | Days (potential cutting interval under ideal summer growing conditions) |
|----------------------|---|
| Winter dormant       | 30–34 days  |
| Winter active        | 27–30 days  |
| Highly winter active | 25 days   |

Indicative feed value of lucerne (5–10% flowering):

ME 10½ MJ ME/kg DM  
 CP 18–20%  
 NDF 50–55%

## Nutrition and fertiliser

Regular soil tests should be taken to monitor nutrient levels and maintain or enhance production. Tissue testing can also be used as an aid in understanding macro and micro nutrient deficiencies.

Lucerne can produce a wide range of yields potentially ranging up to 10–25 tonnes DM/ha/yr. For each 10t DM this equates to 200 kg Ca, and when compared to 360 kg Ca in one tonne of limestone lime, indicated that on average 1T lime/ha every 2 years or so is required to maintain calcium nutrition as well as to help manage pH and Aluminium. Fertiliser is generally applied at intervals that suit the grower. Ideally this is programmed with each cut, but may be only once or twice a year. Molybdenum (Mo) is essential for plant growth and healthy nitrogen fixation. Consider applying 300–500 g/ha of Molybdate or equivalent every 4–5 years where levels are typically low or Mo is neglected from other parts of the system or rotation. Mo should always be applied with Copper included in the program to help avoid animal health issues.

**Crop removals.** For each tonne of dry matter (DM) removed, the following nutrients are lost:

|            |          |
|------------|----------|
| Nitrogen   | 20–30 kg |
| Phosphorus | 2–3 kg   |
| Potassium  | 15–20 kg |
| Sulphur    | 2–4 kg   |
| Calcium    | 10–17 kg |
| Magnesium  | 2–4 kg   |
| Zinc       | 20–50 g  |
| Copper     | 5–10 g   |
| Boron      | 25–40 g  |
| Manganese  | 35–50 g  |
| Iron       | 50–150 g |

### TERMINATING A LUCERNE STAND

If it is necessary to terminate lucerne, glyphosate, clopyralid, dicamba or Grazon Extra can be used. For best results, this should occur when the lucerne is actively growing, before it starts going dormant/less active. The plant also needs to have a good leaf area of up to 30–40cm high, typically 18–24 days after defoliation. Avoid the temptation to graze the stand before terminating, as control is often unsatisfactory.

## Grazing

Ideal management of grazing would require a short-sharp grazing period of 2–3 days, followed by a rest and regrowth period of around 20–25 days over summer and longer over winter, with the stock introduced at around 5–10% flowering and the crop evenly defoliated. This is however rarely achievable due to various factors, but the principles born in mind and grazing management adopted which tends towards this regime. In practice, lucerne will handle limited set-stocking for a period of weeks or a month or two. If periods of set-stocking or lax rotational grazing are likely to occur, there are a number of key things to bear in mind and include in the program:

Stock will have a preference for grazing the leaves in preference to the stems. This may lead to excessive protein intake leading to issues such as red-gut, and potentially bloat. In terms of stock performance, lax grazing may see an initial increase in performance, then the production levels fall off as stock are left with a high proportion of stalks on offer. Try to adopt a system where the entire stalk is consumed along with the leaves. Stock density will be important. Modern cultivars selected for high leaf:stem ratio such as the SARDI range will also help. Consumption of the leaf and stalk together is a relatively balanced diet for ME, CP and fibre.

Allowing the crop to have at least one good flowering per year will aid replenishment of root reserves. Ideally use the appearance of new shoots at the base of the plant (approx. 10% flowering) to determine cutting/grazing timing – this will help top-up root reserves during the year. This will ideally take place in mid-late autumn, as the plant will then contain good reserves to come away the following spring. The feed reserve built up over the rest period in autumn can be fed off as valuable early winter feed, prior to winter cleaning sprays.



# GRAZING TOLERANT LUCERNE

Most lucerne cultivars can be grazed with success, however periods of continuous or repeated close grazing will quickly thin out stands of varieties not specifically developed and evaluated for this purpose.

True grazing tolerant varieties have been screened and re-selected under protocols which provide such features as a low and broad crown, high numbers of crown buds and have been subjected to very high grazing pressure for extended periods. This does not mean that such varieties ought to be treated in such a brutal fashion as a rule, but allows the producer a longer-term stand that will have greatly improved capacity to survive and produce where periods of set-stocking and/or lax grazing are likely. Appropriate fertiliser, weed and pest maintenance will still be required for best results. Also consider that some level of winter-growth activity is appropriate, as this will enable forage production through the typically cool-season dominant rain-fall pattern of much of Australia. A properly evaluated cultivar developed for and selected under grazing in Australia with a 6 or 7 dormancy rating is often most appropriate for a long-term grazing option.

## SARDI-GRAZER LUCERNE

**Dormancy 6 Winter Active**

 **325mm+**

 **Deep & well drained**

 **5.8-8.0**

 **AL or AgriCote**

SARDI-Grazer is the most persistent and grazing tolerant lucerne in Australia. A new variety, it was established primarily for use in cropping rotations, where large paddocks limit the use of rotational grazing. It delivers superior persistence where uneven grazing causes areas of paddocks to be heavily grazed before others can be properly utilised. It is also useful in permanent pastures in the medium to high rainfall areas where long periods of continuous grazing (more than four weeks) by sheep or cattle is common practice.

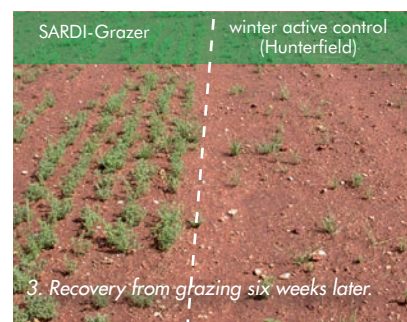
SARDI-Grazer was developed by SARDI and the Department of Agriculture and Food, Western Australia, with funding from the GRDC. The final parental plants used to develop this variety were selected based on resistance to aphids and diseases (BGA, SAA, PRR, and Anth), herbage yield and quality plus winter activity rating.

SARDI-Grazer is the ideal choice for grazing enterprises where mob sizes restrict rotational grazing and when a long-term stand is required.

Key features:

- The most grazing tolerant commercial lucerne variety in Australia
- Persists under periods of set stocking up to two months once established
- Requires minimal rotational grazing management
- Exceptional persistence across a range of environments from low to high rainfall, dryland and irrigation
- Broadly adapted to a variety of farming systems including quality hay
- Well suited to mixed swards with perennial grasses such as winter active tall fescue, cocksfoot, phalaris or sub-tropical grasses.

### Grazing tolerance and recovery of SARDI-Grazer



## WINTER ACTIVE LUCERNE

Winter active lucernes are the most versatile, providing good growth into late autumn and holding their quality longer than highly winter active varieties. Best suited to medium-term mixed farming situations that require grazing tolerance and the ability to make reasonable quality hay. They are ideal for irrigated or dryland production and are useful as a pure stand or as a perennial legume component in pasture blends for regions with 450–650 mm winter dominant rainfall. These lucernes also make excellent permanent summer forage crops in the high rainfall dairy regions because they provide feed over a longer period than summer brassicas without the same insect problems.

### SARDI 7 SERIES 2 LUCERNE

SARDI 7 Series 2 is the next generation winter active lucerne. It is even more versatile, broadly adapted and persistent than SARDI 7 offering a greater performance in cold, wet environments where lucerne can struggle. It has been bred specifically for the Australian climate and farming operations and will perform well in both dryland and irrigated systems. It offers superior performance where persistent, high-producing lucerne stands are required and in grazing situations where winter produced feed can be utilised. SARDI 7 Series 2 is also the only lucerne in Australia with any tolerance to the new highly virulent BGA strain.

#### Dormancy 7 Winter Active



350mm+



Deep & well drained



5.8–8.0



AL or AgriCote

Key features:

- Even more broadly adapted and grazing tolerant than SARDI 7
- High yielding, multi-purpose with excellent persistence
- Strong pest and disease resistance and good grazing tolerance
- Improved performance in cold, wet environments
- Well suited to grazing and hay production with a broad crown and high leaf to stem ratio.

### GENESIS II LUCERNE

Growers who have for many years enjoyed the benefits of Genesis lucerne, will transition well into Genesis II. Selected from 68 parents within the NSW DPI lucerne breeding program through the Australian Lucerne Alliance collaboration, Genesis II is an improved variety that has resistance to all three strains of Anthracnose and Phytophthora Root Rot, plus increased persistence over the trialling period. Genesis II has stable high yields and the required feed quality to satisfy both grazing and forage production markets.

#### Dormancy 7 Winter Active



350mm+



Deep & well drained



5.8–8.0



AL or AgriCote

Key features:

- 3–5% improved herbage yield compared to Genesis
- Winter active variety resistant to major root diseases
- Well suited to hay and grazing production systems
- Excellent persistence with improvements over Genesis
- Demonstrates good resistance to major aphid groups.

## HIGHLY WINTER ACTIVE LUCERNE

Highly winter active lucernes are bred for late autumn/early winter sowing and have excellent seedling vigour for undersowing. They have a more upright crown, erect growth habit and are well suited to a 2–4 year cropping rotation system in 300–500 mm rainfall zones. They provide maximum growth from winter dominant growing season rainfall. Some of the newer Australian-bred varieties in this group have increased grazing tolerance because they were selected from and developed for broadacre grazing systems.

### SARDI 10 SERIES 2 LUCERNE

SARDI 10 Series 2 is a highly winter active lucerne with the greatest activity rating over any other SARDI variety. During its development, the breeder was successful in focusing on improving the very popular SARDI 10. The greatest emphasis was on increasing forage production and quality, pest and disease resistance, persistence and grazing tolerance. A key physical feature is the greatly improved leaflet density down the length of each stem. These advancements allow for even greater adaptability to Australian farming systems.

#### Dormancy 10 Highly Winter Active

 350mm+

 Deep & well drained

 5.8–8.0

 AL or AgriCote

Key features:

- Suited to cropping rotations, pasture mixes and year-round hay production systems
- Improved forage production and persistence over SARDI 10
- High winter growth and grazing tolerance
- Very good seedling vigour
- Highly productive 3–4 year+ option
- Multiple screens for excellent disease and insect resistance.

## WINTER DORMANT LUCERNE

Winter dormant lucernes grow actively through spring and summer and into early autumn when growth rates decline. They are best suited to irrigated hay production or long-term pasture situations in colder, wetter environments, where rainfall continues into late spring and early summer, and winter grazing is provided by other pastures or crops. Winter dormant lucernes are not suited to late autumn/early winter sowing.

### SARDI 5 LUCERNE

A semi-winter dormant variety, SARDI 5 benefits from a bushy growth habit, fine stems and a low, broad crown making it very persistent under grazing. It performs well in irrigated and dryland environments and is particularly suited to both challenging cold, wet environments and extensive low rainfall systems. It is also a good choice for sites with known disease pressure. SARDI 5 is best suited to farming systems where long term persistence, summer production and herbage quality are the most desired traits and winter production is not required.

#### Dormancy 5 Semi-Winter Dormant

 325mm+

 Deep & well drained

 5.8–8.0

 AL or AgriCote

Key features:

- Semi-winter dormant variety with fine stems and a low, broad crown
- Suited to both challenging, wet, cold environments and extensive low rainfall systems
- Persistent under grazing and performs well in both irrigated and dryland environments
- Good Anthracnose and Phytophthora root disease resistance
- Ideal for hay production with very bushy and dense growth.

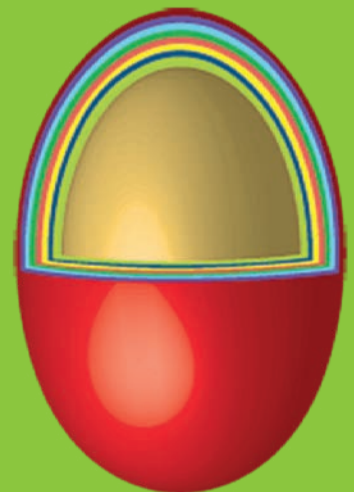
# LUCERNE PRODUCT ADAPTION CHART

| Product                                    | Dormancy Rating | Rainfall (min)               | Region     | Sowing rate (low-med rainfall) | Sowing rate (med-high rainfall) | Sowing rate (irrigation) |
|--|-----------------|------------------------------|------------|--------------------------------|---------------------------------|--------------------------|
| <b>SARDI 5 LUCERNE</b>                     | 5               | 325 mm–400 mm                | All states | 4–10 kg/ha                     | 4–12 kg/ha                      | 12–25 kg/ha              |
| <b>SARDI-GRAZER LUCERNE</b>                | 6               | 325 mm–400 mm                | All states | 4–10 kg/ha                     | 4–12 kg/ha                      | 12–25 kg/ha              |
| <b>SARDI 7<sup>SERIES 2</sup> LUCERNE</b>  | 7               | 350 mm–425 mm                | All states | 4–10 kg/ha                     | 5–15 kg/ha                      | 12–25 kg/ha              |
| <b>GENESIS II LUCERNE</b>                  | 7               | 350 mm–425 mm                | All states | 4–10 kg/ha                     | 5–15 kg/ha                      | 12–25 kg/ha              |
| <b>SARDI 10<sup>SERIES 2</sup> LUCERNE</b> | 10              | 350 mm+(sth)<br>425 mm+(nth) | All states | 4–10 kg/ha                     | 5–15 kg/ha                      | 12–25 kg/ha              |

## Seed coating

Using coated seed when sowing lucerne has become the accepted best practice in Australia in recent years.

Lucernes are available from Heritage Seeds with the proprietary AgriCote seed coating technology. AgriCote is designed to deliver enhanced seedling establishment through the inclusion of growth promotants, essential micro-nutrients and fungicide seed protection. In addition, AgriCote provides seedlings from protection biting and sucking insects through the inclusion of Gaucho insecticide seed treatment. For lucerne seed, AgriCote also contains encapsulated Rhizobia bacteria, meaning your seed is pre-inoculated and ready to sow.



| pH (CaCl <sub>2</sub> ) | Soil Type   | Inoculant                | Suitability | Disease and pest resistance |                  |                       |             |
|-------------------------|---|--------------------------|-------------|-----------------------------|------------------|-----------------------|-------------|
|                         |   |                          |             | Spotted Alfalfa Aphid       | Blue Green Aphid | Phytophthora Root Rot | Anthracnose |
| 5.8–8.0                 | Light-to-medium and heavy, deep, well-drained soils | <b>AgriCote</b><br>or AL | H S G C     | HR                          | HR               | HR                    | HR          |
| 5.8–8.0                 | Light-to-medium and heavy, deep, well-drained soils | <b>AgriCote</b><br>or AL | H S G C     | HR                          | HR               | R                     | R           |
| 5.8–8.0                 | Light-to-medium and heavy, deep, well-drained soils | <b>AgriCote</b><br>or AL | H S G C     | HR                          | HR               | HR                    | HR          |
| 5.8–8.0                 | Light-to-medium and heavy, deep, well-drained soils | <b>AgriCote</b><br>or AL | H S G C     | HR                          | R                | R                     | HR          |
| 5.8–8.0                 | Light-to-medium and heavy, deep, well-drained soils | <b>AgriCote</b><br>or AL | H S G C     | HR                          | HR               | R                     | R           |

**Suitability key:**

H = Hay

S = Silage

G = Grazing

C = Cut and Carry

**Disease and pest resistance key:**

LR = Low Resistance

S = Susceptible

MR = Moderately Resistant

R = Resistant

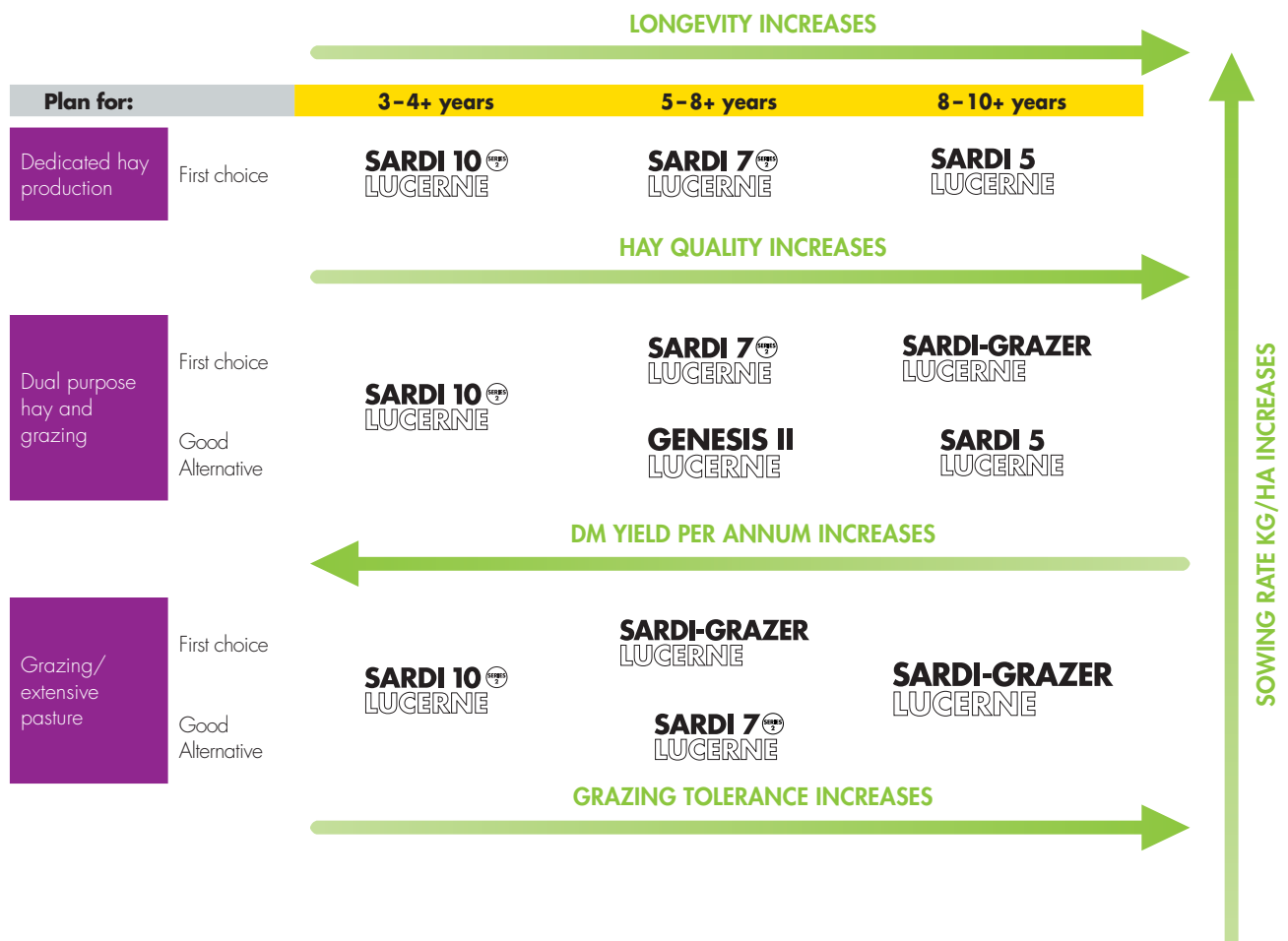
HR = Highly Resistant

# LUCERNE PREPARATION CHECK-LIST

## Lucerne Preparation Check-list

| Question?                                      | Yes                     | No – Action required  |
|--|-------------------------|---|
| Lucerne not grown in site for at least 2 years | OK                      | Crop for at least 2 years with alternative species.   |
| Drainage OK.<br>(casual water lays < 1 day)    | OK                      | Improve drainage or select alternative site.  |
| pH (CaCl <sub>2</sub> ) > 5.7                  | OK                      | Increase pH through liming or select alternative site.  |
| Exchangeable Al <sup>3+</sup> < 5%             | OK                      | Decrease Aluminium at depth through liming over a number of years or select alternative site. |
| Weed burden previously reduced                 | OK                      | Crop for 1–2 years with cereals or other grain crops, paying attention to weed control.       |
| Irrigation available                           | Spring sow OK           | Autumn or early spring sow.   |
| Winter Active variety (dormancy rating >6)     | Autumn or spring sow OK | Spring sowing recommended in winter cold areas, for winter dormant varieties.                 |

## Variety to fit the job



## Lucerne Sowing Rates

| Annual rainfall | Marginal-Dryland<br>(350 mm–450 mm) | Dryland<br>(450 mm–600 mm) | Favourable Dryland<br>(600 mm–800 mm) | High Rainfall/Irrigated<br>(800 mm+ / Irrigated) |
|-----------------|-------------------------------------|----------------------------|---------------------------------------|--|
| kg/ha           | 4–6                                 | 6–8                        | 10–12                                 | 15–25  |

It is strongly recommended that prior to sowing, a pre-plant, pre-emergent herbicide be considered. Herbicides such as trifluralin and pendimethalin are commonly used with good success. Consult an agronomist and check label instructions before proceeding. Low-till/no-till systems can be used to good effect, but paddock preparation, weed burden and herbicide spray systems need to be considered and prepared for prior to sowing.

## Lucerne stand thinning out?

Sometimes after a number of years, lucerne plant numbers in a paddock may reduce to lower than desirable levels, but the lucerne stand may still be the best option for a while yet. It can be a very useful strategy to over-sow the stand with a suitable companion species. If a full lucerne stand is required on that site, then it is better to terminate the existing lucerne, crop for a few years, address reasons for decline, and then re-sow.

## For winter dominant rainfall zones:

| Desired outcome:              | Marginal-Dryland<br>(350 mm–450 mm)   | Dryland<br>(450 mm–600 mm)   | Favourable Dryland<br>(600 mm–800 mm)  | High Rainfall/Irrigated<br>(800 mm+ / Irrigated)   |
|-------------------------------|---|--|--|--|
| Keep lucerne for 1 more year  | Over-sow in autumn with a one-year species, terminate crop in following summer.   |  |  |  |
|                               | <b>MAMMOTH FORAGE OAT</b><br><br>oats<br>20–60 kg/ha  | <b>VORTEX ANNUAL RYEGRASS</b><br><br>annual ryegrass<br>10–15 kg/ha          | <b>ARNIE ANNUAL RYEGRASS</b><br><br>annual ryegrass<br>10–15 kg/ha                           | <b>ASTON ITALIAN RYEGRASS</b><br><br>Italian ryegrass<br>15–20 kg/ha                       |
| Keep lucerne for 2 more years | Over-sow in autumn with a one-year species, terminate crop in following summer.   |  |  |  |
|                               | <b>HULK ITALIAN RYEGRASS</b><br><br>Italian ryegrass<br>8–12 kg/ha  | <b>HULK ITALIAN RYEGRASS</b><br><br>Italian ryegrass<br>10–15 kg/ha          | <b>COMMANDER CHICORY</b><br><br>chicory<br>4–8 kg/ha   | <b>ASTON ITALIAN RYEGRASS</b><br><br>Italian ryegrass<br>15–20 kg/ha                       |
| Keep lucerne for 3 more years | Over-sow in autumn with a one-year species, terminate crop in following summer.   |  |  |  |
|                               | <b>BARENO GRAZING BROME</b><br><br>grazing brome<br>6–10 kg/ha  | <b>BARBERIA LONG ROTATION RYEGRASS</b><br><br>hybrid ryegrass<br>10–12 kg/ha | <b>SHOGUN<sup>(NEA2)</sup> HYBRID RYEGRASS</b><br><br>hybrid ryegrass<br>12–15 kg/ha         | <b>SHOGUN<sup>(NEA2)</sup> HYBRID RYEGRASS</b><br><br>hybrid ryegrass<br>15–20 kg/ha       |
| Keep lucerne indefinitely*    | Over-sow in autumn with a one-year species, terminate crop in following summer.   |  |  |  |
|                               | <b>ATLAS PG PHALARIS</b><br><br>phalaris<br>2–3 kg/ha   | <b>HOLDFAST GT PHALARIS</b><br><br>phalaris<br>3–5 kg/ha                     | <b>IMPACT 2<sup>(NEA2)</sup> PERENNIAL RYEGRASS</b><br><br>perennial ryegrass<br>10–15 kg/ha | <b>BEALEY<sup>(NEA2)</sup> PERENNIAL RYEGRASS</b><br><br>perennial ryegrass<br>15–20 kg/ha |
| Full lucerne stand required   | Terminate current stand. Crop for 2 years minimum to utilise nitrogen fixation from the lucerne. Address reasons for decline such as weed burden, fertility, pH, drainage, cultivar disease susceptibility, prior to re-sowing lucerne. |  |  |  |

⇔ = interchangeable

Note: In low-medium rainfall areas, an alternative to oversowing with grass is to consider introducing 6-8kg/ha of one or two sub-clovers that suit the environment. Antas should be considered as a very good option for 3-4 years, Mintaro, Campeda and Monti for a longer time-frame.

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