BARENBRUG

Alfalfa International Production Guide

EDITION 5

Grow with Confidence

Barenbrug Alfalfa Development Program

Barenbrug continues to lead the improvement of alfalfa forage solutions through several exciting projects with continual development of cultivars for important farming systems. New varieties of alfalfa are continually being assessed in the field via replicated trials and laboratory screening for improvement on aspects such as overall yield, seasonal yield, persistence, forage quality and disease and pest tolerance. Crucial to the success of a alfalfa cultivar is choosing varieties that are broadly adapted, offering proven performance, grazing persistence, and pest and disease resistance.

The South Australian Research and Development Institute (SARDI) manages the largest and longest running alfalfa breeding program in the country. It is at the forefront of developing new varieties for challenging conditions. Barenbrug has a long, proud history with the program and has been an important part of its success. Since 1992, Barenbrug 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.

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 six to seven 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.

Barenbrug also works with Grasslanz in New Zealand, with the focus on breeding several varieties for the international market. This work was undertaken in the heartland of the Australian alfalfa seed production region at Keith, South Australia, and several new varieties have now been released.

The Barenbrug SARDI breeding program produces alfalfa varieties that can offer:

- **A range of winter activity and dormancy**
- **Superior yield and after-cutting growth**
- **Resistance to pests and diseases**
- **Adaptability to varying climates and soil types**
- **New strains of rhizobium with improved activity at lower soil pH levels.**
- **High forage quality**
- **Persistence under extreme grazing management**
- **Suitability for mixed farm situations.**

Contents

Alfalfa International Production Guide
Edition 5

Editor: Rob Winter, B App. Sci (Ag)
Regional Agronomist – Southern Australia

May 2025

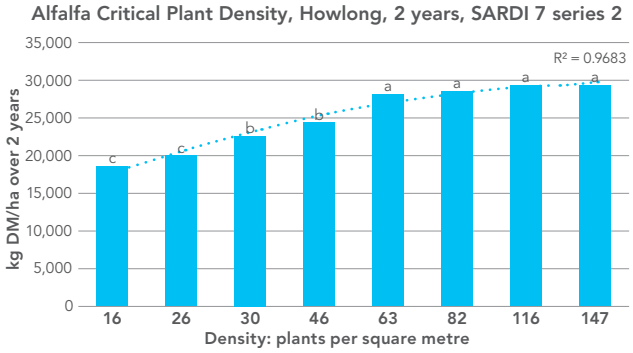
Alfalfa Research Update

Critical plant density trial

Plant density will have implications for the yield and quality of an alfalfa stand. A trial at the Howlong research farm was conducted with varied sowing rates to mimic declining stand density. This information will help empower producers and agronomists to make decisions around retaining, terminating or oversowing alfalfa stands that may have declined over time or failed to establish satisfactorily.

Howlong is a 580mm winter-dominant rainfall site, and in this trial a plant density of around 60-65 plants/m^2 provided a significant benefit over lower plant densities. If stand density were to fall to 30-45 plants/m^2, and the stand retained, this would present a gross opportunity cost of about $1200-$1700 per hectare over the two-years. This may indicate a threshold for action such as terminating the stand and commencing alternative crops or pastures, or perhaps a trigger for over-sowing with another species to extend the yield and the stand-life. Whilst this trial was conducted in one location under a specific management regime, it allows for a starting point when decisions around stand viability need to be made. In areas with wither lower yield potential or fewer viable alternatives, a lower plant density may remain acceptable. Conversely, in situations where higher yield potential on offer, plant density thresholds for stand retention or termination may be higher.

Plants/m^2	Total kg DM/ha	Sig.	Forage value at 30c/kg DM
16	18,373	c	$5,512
26	20,098	c	$6,029
30	22,532	b	$6,760
46	24,282	b	$7,285
63	28,102	a	$8,431
82	28,545	a	$8,563
116	29,375	a	$8,813
147	28,782	a	$8,635
Trial Mean	25,011		
LSD (5%)	2,199		
%CV	5		

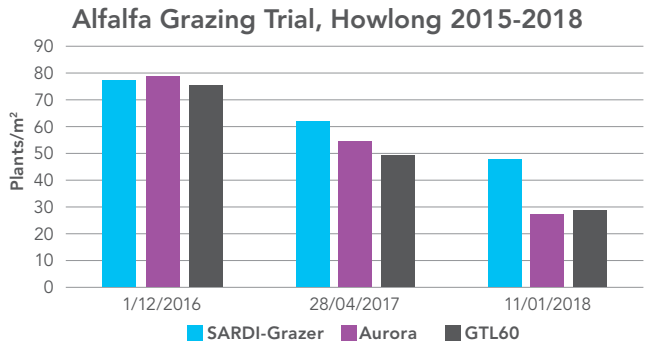


Grazing tolerance trials

Grazing tolerance (GT) has been soundly validated in some very good cultivars—notably SARDI-Grazer and SARDI 7 Series 2. A series of rigorous grazing trials continue to be conducted at Howlong, New South Wales. Whilst we know that SARDI-Grazer is a proven and reliable option, there is opportunity to continue to demonstrate the relative merits of a properly developed GT variety compared to old common types such as Aurora. At the same time, other offerings in the seed market that make claims to grazing tolerance are being assessed. SARDI-Grazer remains absolute stand-out, with Aurora plant density and performance well behind. Other competitor cultivars making claims to GT also appear to have less tolerance than common Aurora. These trials continue to give producers added confidence of properly developed grazing tolerance traits and put some additional clarity on the true nature of other offerings.

After being sown and established in 2015, the trial was subjected to close and continuous grazing by sheep, with some limited regrowth only allowed for the purpose of making accurate plant-counts. Entering the first summer after grazing commenced, plant densities were identical, but after the first summer, numbers declined somewhat. After a further year and into the third summer, the advantage of a well-developed grazing tolerant variety became stark, with SARDI Grazer retaining significantly higher plant numbers. This has implications for stand viability after around 3 years. If a alfalfa pasture is required for three years or more, SARDI grazer should be considered over lower-priced and less resilient alternatives.

	1/12/2016	28/04/2017	11/01/2018	Sig.
SARDI-Grazer	78	62	48	a
Aurora	79	55	27	b
GTL60	76	50	29	b
Trial Mean	77.6	55	34	
LSD	5.6	12	11	
%CV	4.2	12	19	



NEW RELEASE FOR 2027/2028

BAR SEVEN S3
Alfalfa

350mm+

4.8–8.0

Most soils well drained

AL or AGRICOTE

PBR

BAR Seven S3 is a utility alfalfa dormancy 7 for dryland pastures, irrigation, grazing and hay production. BAR Seven S3 offers improved acid tolerance, grazing tolerance and, perseverance in dry conditions, and will replace SARDI 7 series 2 over the 2026-2028 period.

BAR SEVEN S3 is developed from elite parent lines, including SARDI 7 series 2, and initially screened for acid tolerance, drought tolerance and persistence under close grazing. These were then re-selected under grazing from a broad range of Australian farm sites. These include Avoca (Vic), Coolah (NSW), Manilla (NSW), Coleraine (Vic), Tallangatta (Vic), Holbrook (NSW), Turretfield (SA) and Mingbool (SA), ranging in average rainfall from 460-715mm.

A third stage of selection was subsequently conducted for seedling tolerance to low pH.

Forage yield trials commenced in 2022 and are being conducted at Wagga Wagga (NSW), Howlong (NSW), Indigo Valley (Vic), Hamilton (Vic), Derwent Valley (Tas), Dorrigo (NSW) and Bengworden (Vic). Grazing persistence trials are being conducted at Howlong (NSW).

Sheep and lamb producers, cattle graziers, dairy systems and fodder producers will benefit from the improved persistence, stress tolerance and broad adaptation of BAR SEVEN S3.

Applications:

Extensive and intensive grazing systems, as a 5-8 year pasture prospect.

Irrigated, high quality hay production.

Sites that contain areas of lower pH (to 4.8 Ca)

Any applications requiring a dormancy 7-8 Alfalfa.

Pest & Disease Ratings:

Spotted alfalfa aphid (SAA)	HR
Blue-Green aphid (BGA)	HR
Phytophthora root rot (PRR)	HR
Anthracnose	HR

Seed Availability:

AgriCOTE seed treatment including the acid-tolerant SRDI1736 and AL rhizobia strains

25kg bags

Limited seed release from July 2026.

Alfalfa Variety Adaptation Chart

Product	Dormancy Rating	Rainfall (min)	Sowing rate (low-med rainfall)	Sowing rate (med-high rainfall)	Sowing rate (irrigation)
SARDI-Grazer *Alfalfa*	6 (6.5)	325mm +	4–10 kg/ha	6 –15 kg/ha	18 – 35kg/ha
SARDI 7 *Alfalfa*	7 (7.4)	350mm +	4–10 kg/ha	6 –15 kg/ha	18 – 35kg/ha
BAR SEVEN S3 *Alfalfa*	7 (7.5)	350mm - 425mm	4–10 kg/ha	6 –15 kg/ha	12 – 25kg/ha
BAR ST *Alfalfa*	9	350mm+ or Irrigation	4–10 kg/ha	6 –15 kg/ha	18 – 35kg/ha
BAR Alfa 10 *Alfalfa*	10	350mm+ or Irrigation	4–10 kg/ha	6 –15 kg/ha	18 – 35kg/ha
Pegasis HQ *Alfalfa*	10	350mm+ or Irrigation	4–10 kg/ha	6 –15 kg/ha	18 – 35kg/ha
SARDI 10 *Alfalfa*	10	350mm+ or Irrigation	4–10 kg/ha	6 –15 kg/ha	18 – 35kg/ha
Alfamaster Ten *Alfalfa*	10	350mm+ or Irrigation	4–10 kg/ha	6 –15 kg/ha	18 – 35kg/ha
PX3 *Alfalfa*	10	350mm+ or Irrigation	4–10 kg/ha	6 –15 kg/ha	18 – 35kg/ha

Suitability key:

H = Hay
G = Grazing
S = Silage
C = Cut and Carry

Disease and pest resistance key:

NT = Not Tested
S = Susceptible
R = Resistant
LR = Low Resistance
MR = Moderately Resistant
HR = Highly Resistant

pH ($CaCl_2$)	Soil Type	Inoculant	Suitability	Disease and pest resistance			
				Spotted Alfalfa Aphid	Blue Green Aphid	Phytophthora Root Rot	Anthracnose
5.4 – 8.0	Light-to-medium and heavy, deep, well-drained soils	AL or AGRICOTE	H S G C	HR	HR	R	R
5.0–8.0	Light-to-medium and heavy, deep, well-drained soils	AL or AGRICOTE	H S G C	HR	HR	HR	HR
4.8 – 8.0	Light-to-medium and heavy, deep, well-drained soils	AL or AGRICOTE	H S G C	HR	HR	HR	HR
5.4 – 8.0	Light-to-medium and heavy, deep, well-drained soils	AL or AGRICOTE	H G C	HR	HR	R	R
5.4 – 8.0	Light-to-medium and heavy, deep, well-drained soils	AL or AGRICOTE	H G C	HR	HR	R	R
5.4 – 8.0	Light-to-medium and heavy, deep, well-drained soils	AL or AGRICOTE	H G C	HR	HR	R	R
5.4 –8.0	Light-to-medium and heavy, deep, well-drained soils	AL or AGRICOTE	H G C	HR	HR	R	R
5.4 – 8.0	Light-to-medium and heavy, deep, well-drained soils	AL or AGRICOTE	H C	R	R	R	R
5.2 – 8.0	Light-to-medium and heavy, deep, well-drained soils	AL or AGRICOTE	H C	HR	HR	R	R

Alfalfa Dormancy

Alfalfa 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 provide the opportunity for production.

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

Dormancy groups

Dormancy 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 variety is largely dependent upon its dormancy rating, and are designated into groups based on use pattern, longevity and cool-season growth potential. Interpreting the dormancy number may be done in two ways:

- Dormancy number equals the potential number of harvests or grazings per year; or
- The potential growth on offer in inches, after the stand is cut at the autumn equinox.

Dormancy 5 (or less) - winter dormant (WD)

Alfalfa with a rating of 5 or less are sometimes considered for low-stock density, extensive systems or specialty hay cutting. However, they are infrequently used due to lower overall productive potential when compared to contemporary dormancy 6–10 rated varieties. Dormancy 1–5 Alfalfa varieties are only suitable for early autumn or spring sowing.

Dormancy 6–7 – winter active (WA)

This group offers the most flexibility and productive potential longer-term, general purpose grazing or fodder production. In circumstances where a winter dominant rainfall pattern is the norm, 6–7 rated alfalfa has a greater opportunity to capture the potential growth in cooler seasons compared to those rated 5 or lower.

Dormancy 8–10 - highly winter active (HWA)

HWA alfalfa varieties suit a short-term pasture phase to capture year-round grazing opportunity, and are frequently used where fast rotation fodder production is being practiced. HWA alfalfa will typically have a shorter life-span of around 3–4 years, although some varieties, including SARDI 10 Series 2, have exhibited improved persistence in many circumstances.

Dormancy 6–7

- Grazing tolerance + fine hay quality
- SARDI-Grazer, SARDI 7 Series 2 , BAR SEVEN S3
- Alfalfa for 5-8 years or longer

Dormancy 8–10

- High hay yields
- Short-medium term winter grazing
- BAR ST, Bar Alfa 10, Pegasis HQ, SARDI 10 series 2, Alfamaster Ten, PX3

Dormancy ratings

4 6 8 10

Examples of relative growth following cutting after autumn equinox.

Alfalfa Establishment

Sowing rates

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

Rain	kg/ha	Plant counts/m^2 (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.

Higher sowing rates will lead to thinner stems – this technique may be employed for irrigated hay production.
Allow for germination percentage and an establishment factor of 65–75%.

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 if it is needed. pH ($CaCl_2$) should be > 5.4, ideally > 5.8. Aluminium at depth should also be considered and paddock avoided if judged potentially problematic. A lower pH with low Al^{3+} (< 5%) may still be a suitable site.

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 recruitment and nodulation of the Alfalfa roots.

Seed coating

It is recommended to use a coated seed that includes the correct inoculants, essential trace elements 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.

Undersowing in cereals

Whilst it is not considered best practice, if undersowing alfalfa with a cereal grain crop, cut the cereal sowing rate back to 35–40% to ensure a good alfalfa stand is maintained. Anticipate lower cereal yields as a consequence.

Time of sowing

The ideal soil temperature for establishing Alfalfa is 12°C and rising. Alfalfa 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 prior to sowing if the soil is fluffy.

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

Young alfalfa plants are fairly sensitive to frosts. However, once established, plants can survive freezing temperatures.

Pests

An alfalfa crop takes a year to fully establish. A young alfalfa stand needs to be monitored for pests. Using resistant varieties and coated seed should be strongly considered. Always check for pests such as red legged earth mites (RLEM) and use bare earth insecticide controls. Once established, alfalfa 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.

Weed control

An alfalfa 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.

Possible weed control spray options:

Pre-planting	First year - post-emergence	Second & subsequent years
Knock down spray to remove actively growing weeds. Trifluralin may be used to curtail early weed competition at rates depending on soil type. Pendimethalin can also be considered in some circumstances.	The following options can be used up to the 8th trifoliate leaf stage: 1st trifoliate leaf – 2,4-DB, bromoxynil. 2nd trifoliate leaf – flumetsalum, imazamox, imazethapyr. 3rd trifoliate leaf – bromoxynil, + diflufenican, prometryn.	Spray-seed + diuron (take some care with the winter active varieties). Simazine (may be a better option for winter actives). Saflufenacil and terbuthylazine may also be considered. Options as per 1st year, but check for weed size and rates vary. Group 1 grass herbicides.

* Check local laws and regulations and for recommended use patterns and options. This is general advice as to what agronomic options are often suitable - not what may be permitted in various situations. If unsure, consult an experienced local advisor.

Alfalfa Management

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, however, is rarely achievable due to various factors, but the principles borne in mind and grazing management adopted which tends towards this regime. In practice, alfalfa 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 strong tendency 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.

Cutting

Cutting alfalfa 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.

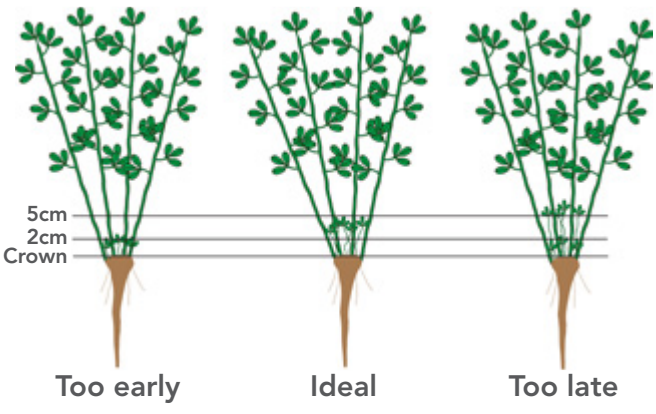
Dormancy	Days (potential cutting interval under ideal summer growing conditions)
Semi winter active	30 – 34 days
Winter active	27 – 30 days
Highly winter active	25 days

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.

Alfalfa 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, indicates that on average one tonne 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 sodium 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



Grazing-tolerant Alfalfa

Most alfalfa 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 rainfall pattern.

SARDI-Grazer *Alfalfa*

Dormancy 6 Winter Active

325mm+

Deep & well drained

pH 5.4–8.0

AL or AGRICOTE

SARDI-Grazer is the most persistent and grazing-tolerant alfalfa in Australia. 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 reduce rotational grazing opportunity and when a long-term stand is required. Hay yield and quality is excellent as there is no yield penalty for using SARDI-Grazer.

Key features:

- The most grazing-tolerant commercial alfalfa 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
- Highly regarded for hay quality hay production
- 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

1. SARDI-Grazer continuous grazing trial near Roseworthy, SA.

2. SARDI-Grazer after eight months of continuous grazing.

3. Recovery from grazing six weeks later.

Winter Active Alfalfa

Winter active alfalfas are the most versatile, providing good growth into late autumn and retain 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 both irrigated or dryland production and are useful as a pure stand or as a perennial legume component in pasture blends for regions with 450 – 650mm winter dominant rainfall. These alfalfas 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 *Alfalfa*

350mm+

pH 5.0–8.0

Deep & well drained

AL or AGRICOTE

SARDI 7 Series 2 is the next generation winter active alfalfa. Versatility, broad adaptation and persistence make it a market leading variety, offering greater performance in cold, wet environments where alfalfa can struggle. It has been bred specifically for farming operations and will perform well in both dryland and irrigated systems. It offers superior performance where persistent, high producing alfalfa stands are required and in grazing situations where winter produced feed can be utilised.

Key features:

- Broad adaptability - Shown to grow/persist in acidic soils down to pH 5.0 $CaCl_2$
- Exceptional persistence
- 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.

Highly Winter Active Alfalfa

Highly winter active alfalfas are bred for late autumn/early winter sowing and have excellent seedling vigour for undersowing. Generally, 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.

BAR Alfa 10
Alfalfa

Dormancy 10 Highly Winter Active

350mm+/Irrigated

Deep & well drained

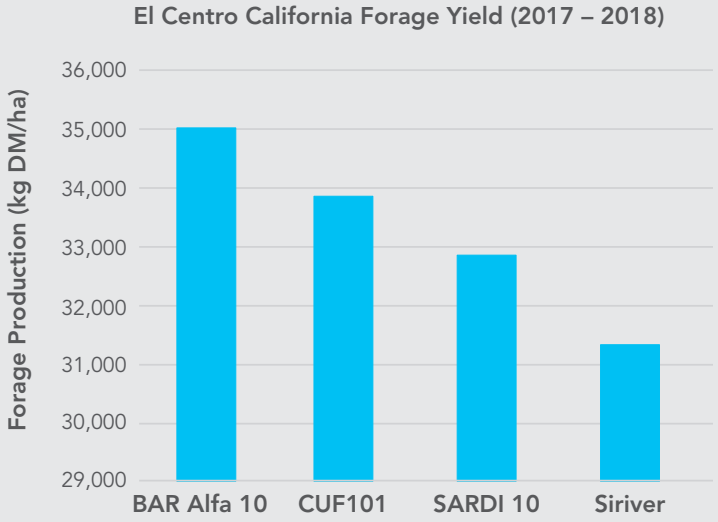
pH 5.4–8.0

AL or AGRICOTE

Perfectly suited to cut and carry operations, BAR Alpha 10 is a high performing, highly winter active variety bred from elite parent material from Australia and the USA. It demonstrates extremely fast establishment and will provide high year round forage yield, which means it can be adapted to various farming systems that demand high performance products.

Key features:

- High yield potential, exceptional trial results in both Australian and US trials
- Superior establishment and reduced time to first cut compared to CUF 101 and Siriver
- Bred for improved persistence and productivity over traditional dormancy 10 varieties
- Good all round pest and disease resistance/tolerance
- Very high yielding in desert environments
- BAR Alpha 10 35% higher first cut increase over CUF 101 and Siriver in US trial results.



Independent trial data from the University of California for both forage yield and winter activity.

Pegasis HQ
Alfalfa

Dormancy 10 Highly Winter Active

350mm+/Irrigated

Deep & well drained

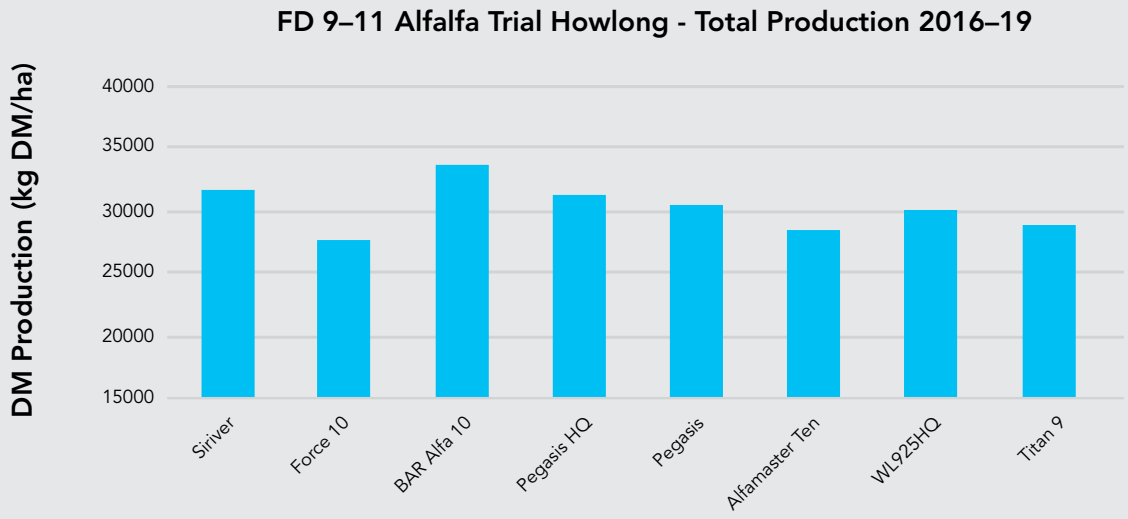
5.4–8.0

AL or AGRICOTE

Similar to BAR Alfa 10, Pegasis HQ is bred from elite parent material from Australia and the USA. A highly winter active variety, once established it will persist well from year to year to provide superior all year round forage yield so it can be adapted to grazing/hay cut farming systems.

Key features:

- Exceptional forage yield in both temperate and desert environments
- Semi erect plant growth habit
- High winter growth and grazing tolerance
- Excellent disease and insect resistance package
- Impressive all year forage production
- Superior early yield Pegasis HQ 25% higher than CUF 101 and Siriver in US yield trial.



BAR ST
Alfalfa

Dormancy 9 Highly Winter Active

350mm+ | Deep & well drained

5.4–8.0 | AL or AGRICOTE

BAR ST is highly winter active variety with a dormancy rating of 9. Developed from elite germplasm from the USA and Argentina, it provides excellent forage quality, performance and persistence by out competing varieties such as CUF101 (23%) and HybriForce 800 (13%) in Argentina. BAR ST offers improved salt tolerance for germinating seedlings over other traditional alfalfa varieties. This allows for potentially better establishment in regions where moderate salt levels can limit plant establishment. BAR ST is a superior alternative to Alfamaster 9®.

Key features:

- Dormancy 9 winter activity rating
- Demonstrated >20% productivity over CUF101 in Argentina
- Salt tolerance demonstrated in establishing alfalfa
- Strong plant vigor and establishment
- Highly resistant to fusarium wilt, phytophthora root rot and pea aphid
- Resistant to anthracnose.

SARDI 10 Series 2
Alfalfa

Dormancy 10 Highly Winter Active

350mm+ | Deep & well drained

5.4–8.0 | AL or AGRICOTE

SARDI 10 Series 2 is a highly winter active Alfalfa 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.

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 & insect resistance
- Perfectly suited to desert environments where they are utilised under high intensive farming systems.

Alfamaster™ Ten
Alfalfa

Dormancy 10 Highly Winter Active

350mm+/Irrigated

Deep & well drained

5.4–8.0

AL or AGRICOTE

Alfamaster Ten has been bred for excellent production and persistence under irrigation rotations achieving an average of 17% over and above CUF101 in USA trials. Alfamaster Ten demonstrates excellent seedling vigour and fast establishment compared to other highly winter active types and will form a very leafy and densely branched growth habit with large erect crowns. These features will allow it to deliver superior productivity and performance compared to many other highly winter active hay varieties, particularly when very productive stands need to be maintained for 2 to 3 years under irrigated situations.

Key features

- Potential for extra cut per year due to increased winter activity
- Superior herbage production and excellent regrowth – on average 17% higher than CUF101
- Highly resistant to pea aphid and fusarium wilt. Resistant to other aphid types, anthracnose, phytophthora root rot, stem and root knot nematodes and bacterial wilt
- Superior option for short term rotation with maximised herbage production
- Excellent seedling vigour
- Perfect for cut and carry operations in desert environments.

PX3
Alfalfa

Dormancy 10 Highly Winter Active

350mm+/Irrigated

Deep & well drained

5.4–8.0

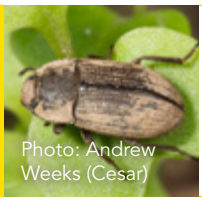
AL or AGRICOTE

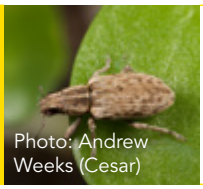
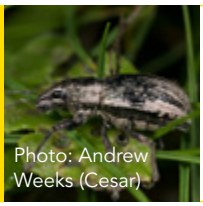
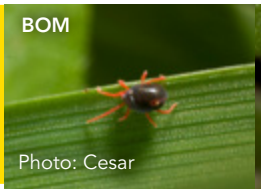
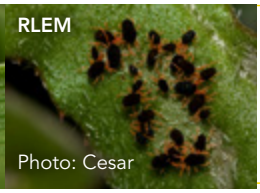
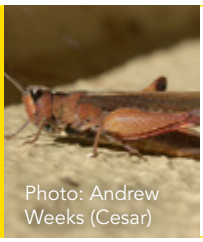
PX3 has been developed for high input/output farming systems and demonstrates superior production and persistence under irrigation rotations. Significant improvements have been made over CUF101 and other high dormancy USA bred varieties, particularly when grown in desert environments. It demonstrates excellent seedling vigour and faster establishment compared to other highly winter active types and will form a very leafy and densely branched growth habit. These features will allow it to deliver superior productivity and performance compared to other highly winter active hay varieties and is best utilised for irrigated 2 to 3 year stand rotations.

Key features

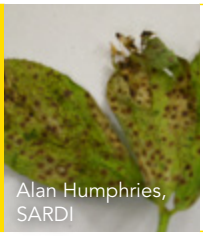
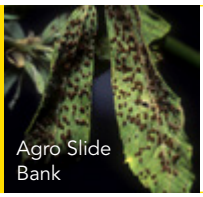
- Exceptionally fast establishment and year one yield
- Improved yield prospects compared to CUF101/Siriver
- Short-term rotations for high output farming
- Excellent pest and disease resistance
- Exceptional seedling vigour
- Amazing regrowth after cutting and grazing
- Perfectly suited to desert environments where they are utilised under high intensive farming systems in arid environments.

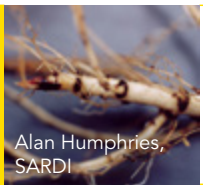
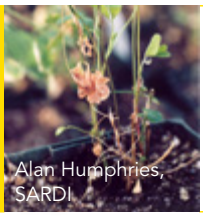
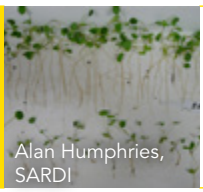
Alfalfa Pests

			Description	Damage	Control
Aphids	**Bluegreen aphid (BGA)** *Acyrthosiphon kondoi*	 Photo: Andrew Weeks (Cesar)	Primary pest of alfalfa and other legume crops. Adults and wingless forms are dull blue-green to 3mm long. Long legs and antennae compared to other aphids. Colonies are active and multiply in autumn, winter, spring and in summer in cooler zones.	Initially attack buds, upper stems and new shoots, causing yellowing, stunted growth and leaf drop. Curling of leaves is typical indication. Particularly damaging in dry-stressed crops. May also be a vector for some virus diseases.	Sow less susceptible varieties such as the SARDI range. Use seed treated with correct systemic insecticide, monitoring, and an integrated spray program. Selective options for aphids are readily available and should be used to protect beneficial/ parasitic insect populations. Rotational grazing or harvesting may significantly reduce aphid damage.
	Spotted alfalfa aphid (SAA) *Therioaphis trifolii*	 Photo: Andrew Weeks (Cesar)	Widespread pest of pasture legumes. Aphids are up to 2mm long, yellow to pale green. Up to 6 rows of dark spots on upper abdomen. Mostly active spring to autumn.	Cause whitening of leaf veins, wilting and leaf-fall, usually starting near the crown of the plant and migrating upwards. May cause plant/stand death. May also be a vector for some virus diseases.	
Beetles	**Blackheaded cockchafers** *Acrossidus spp.*	 Photo: Andrew Weeks (Cesar)	Black-brown shiny scarab 10–12mm in length. Adults emerge to fly in mid-late summer, laying eggs in short, (often) weaker pastures. Eggs hatch early autumn. Larvae fairly wriggly, off-white, slender body from 3–15mm. Shiny black head.	Most severe in mid-late autumn in existing or newly direct drilled pastures. Burrowing undermines roots, and grubs will surface feed on all useful pasture plants including grasses, Alfalfa and clovers. Burrows found near soil piles.	Cultivation, fallow or break crops may assist. Phalaris and cocksfoot more resilient than other pasture species. Readily controlled with insecticide sprays.
	Wireworm and false wireworm *Elateridae spp and Gonocephalum spp.*	 Photo: Andrew Weeks (Cesar)	Wireworm: Dark-grey-brown-black oblong. Also known as click beetle. False wireworm: Adult similar colours but oval shape. Cream-yellow-golden larvae. Distinctly segmented body.	Eggs laid on or just below surface. Eat germinating seeds and roots of young seedlings. Usually in upper 5cm of soil. Adults may chew and ringbark seedling stems. Often a pest of weedy or trashy sites, especially low/no till situations.	Reduce crop trash. Cultivation and fallowing. Knock-down insecticides. Suitable seed coating insecticide.
Moths	**Heliothis** *Helicoverpa spp.*	 Photo: Andrew Weeks (Cesar)	Adults brown with a light pattern to 25mm. Wings held flat. Caterpillar larvae from 1.5mm to 50mm. Light brown with dark heads, developing stripes as they age.	Eggs single or in small clusters. 1mm diameter, white, domed become orange-brown prior to hatching. Will chew large holes in leaves. Also feed on many other crops.	Cultivation and knock-down insecticide before sowing. Monitoring of crops through life-span. Chemical control.
	Corbie grubs *Oncopera spp.*		Brown-grey moths to 30mm long, 40mm wingspan. Eggs <1mm laid in long grass and trash, initially cream turning black over time. Larvae from 3mm to 60mm long, grey-purple with shiny head. Soil tunnels with clean entrance (no spoil).	Caterpillars from 30mm or so will surface feed at night to denude pastures of perennial grasses, especially from late autumn-early spring. Weakened root system and crown feeding will lead to pulling and bare patches in paddocks.	Keep pastures short or well grazed through late spring and summer. Chemical control is effective with timely application, usually mid-autumn.
	Greasy, pink, brown (True) cutworms *Agrotis spp.*		Often one of 3-4 species, including Bogong moth. Adults grey-brown from 36 to 45mm wingspan. Larvae up to 50mm long, grey to dark grey, often pinkish, plump, found just at or below soil surface, often curled up.	Eggs laid in moist, loose soil. Young larvae may chew foliage, larger caterpillars cut stems of seedlings at ground level. Mostly feed at night. Also feed on other crops including establishing pasture. May be found virtually year-round.	Cultivation and knock-down insecticide before sowing. Monitoring of early crops stages. Chemical control.

			Description	Damage	Control
Weevils	**Sitona weevil** *Sitona discoideus*	 Photo: Andrew Weeks (Cesar)	Small grey-tan weevil to 3mm long. Grubs to 3mm, chubby pale and legless, often feed on or burrow into legume nodules. Adults disperse by flying.	Larvae feed on roots of alfalfa and other pasture legumes and flat-weeds. Grasses rarely affected by grubs, but adults will feed on most pasture species including grasses, leaving a scalloped leaf edge. Young tillers in no-till very susceptible.	Cultivation and fallow. Chemical control may be an option if needed in heavy infestations.
	Whitefringed weevil *Naupactus leucoloma*	 Photo: Andrew Weeks (Cesar)	Adults grey-tan with dark striations, large weevil to 12mm long. Larvae to 12mm, fat, cream with pale indistinct head region with distinct chewing mouth parts.	Most often a pest of established alfalfa, especially 2–3 year old stand out of no-till establishment when damage may appear as wilting and plant loss in summer. Avoid close cropping with other hosts e.g. potatoes, peas, etc.	Farm hygiene, crop rotations and cultivation. Cereal break crop. Soil fumigation may be an option. Sprays ineffective.
Others	**Red-legged earthmite (RLEM) & blue oat mite (BOM)** *Halotydeus destructor, Penthaleus spp.*	 BOM Photo: Cesar  RLEM Photo: Cesar		Especially problematic in emerging and seedling alfalfa. Mites will suck the nutrients from swelled seeds and young plants. If plants are older, a typical whitening/silvering of part or all of the leaflets is evident.	Use seed treated with correct systemic insecticide, monitoring, and an integrated spray program.
	Lucerne flea *Sminthurus viridis*	 Photo: Cesar	Wingless, yellow-green insect from 1–3mm in size. Pale yellow eggs laid in spring and autumn or in moist summer areas in clusters at soil level. Adults have a leaping action and often called 'springtails'.	Spring and autumn, summer pastures also affected. Clover, grass and alfalfa leaves initially speckled then windowed out. Severe infestations may strip leave back to veins and petioles.	Monitoring of pastures or crops. Close grazing to admit summer heat/ sunlight into canopy. Chemical control.
	Wingless grasshopper *Phaulacridium vittatum*	 Photo: Andrew Weeks (Cesar)	Grey-brown adults to around 18–20mm. Occasionally develop wings to fly short distances. Eggs laid in autumn to 20mm under soil surface, hatching early summer. Juveniles from 4–5mm pinkish, to brown 8–10mm, size increasing with maturity.	Summer and autumn pest. Prefer to feed on broad-leaved species, especially clovers and broad-leaved weeds and often found on overgrazed sites. May do severe damage in dry years on green summer pastures.	Improve pasture growth ensuring grasses are well maintained. Chemical control.
	Slugs and snails *(many species)*	 Photo: D Hobern, Atlas of Living Australia	Slugs may be black-grey to yellow-brown, from 1mm to 35–50mm. Eggs often cluster in soil and trash 1–1.5mm soft, white-transluscent. Snails of various sorts including garden snails and conical (pointed).	Newly hatched, very small slugs may feed within drill-rows and not emerge to take surface baits. Damage may occur to all parts of plants at any stage. Seedlings especially vulnerable. Older leaves typically have oblong windows rasped out.	Sow seed with an approved slug bait in problem situations. Monitor and re-apply if needed. Cultivation will assist initially. Harrowing or rolling may be beneficial.

Alfalfa Diseases

			Cause	Symptoms & damage	Control options
Seedling	**Damping-off** *Pythium spp., Rhizoctonia solani, Fusarium spp., Phytophthora spp.*	 NSWDPI	Fungal complex affecting emerging seedlings. Very common in most soils under continually wet conditions. Spores spread by water, wind, soil etc. Exacerbated by over-watering and sowing seed too heavily.	Seedlings may either fail to emerge or, shortly after emergence, wilt and fall over with characteristic wasting of stem, often with dark lesions. May severely reduce viability of a new stand.	Use of seed treated with appropriate fungicide or AgriCOTE. Sow in conditions that promote rapid establishment (good seed-bed, warmer rather than cooler).
Leaf and stem	**Alfalfa mosaic virus (AMV)**	 Alan Humphries, SARDI	Virus hosted by alfalfa, perennial clovers, French beans and peas. Spread by aphids. Infected seed is most likely initial cause of stand infection.	Continuum from minimal to severe stunting of growth, pale mottling of leaves. Some strains under heavy infection may lead to stand death.	Sow seed known to be free of AMV. Control of vectors (aphids) especially in spring before numbers build up.
	Common leaf spot *Pseudopeziza medicaginis* **Pepper spot** *Leptoshphaerulina trifolii*	 Alan Humphries, SARDI	Fungii hosted by alfalfa, clovers and medics. Spread by crop debris and wind, rain etc. Development of diseases usually seen in cool-moist weather over mid-late winter, or occasionally on new re-growth after hay cutting.	Circular brown-black spots to 3mm over upper leaf surface. Leaves curl, yellow, brown and fall off. May also affect leaf petioles. Severe infections although rare, may reduce yield and feed quality.	Fungicide options may be available. Rotational grazing, removing whole crop and good crop hygiene is usually all that is required.
	Rust *Uromyces striatus*	 Agro Slide Bank	Commonly occurring fungal leaf disease, spread by wind and rain splash etc. Outbreaks favoured by warm, moist conditions. Spores or mycelium on plants and litter potential source of re-infection.	Red-brown pustules on the leaves and upper stems. Heavy outbreaks cause leaf fall, lower stock-feed value and reduced yield.	Complete grazing and regular harvesting to reduce canopy and local humidity.
	Downy mildew *Peronospora trifoliorum*	 NSWDPI	Widespread and occasionally important fungal disease hosted by lucerne and perennial clovers. Fungus develops under damp conditions and may carry-over in infected plant crowns. Dispersed by wind etc.	Autumn sown, slowly establishing seedlings the most readily affected. Lightening and curling of leaflets. Underside may be slight purple to grey. Affected young stems/shoots may wilt and die. Often first cut of the season is the most affected.	Complete grazing and regular harvesting to reduce canopy and local humidity.

		Cause	Symptoms & damage	Control options
Root and crown diseases	**Phytophthora (root rot)** *Phytophthora medicaginis*  Alan Humphries, SARDI	Fungal disease hosted by alfalfa and medics, and also chickpeas and carrots. Initially may reduce establishment by damping off. Usually the greatest cause of stand death in heavier/wet soil conditions.	Yellowing, dwarfing and die-back/ thinning of stands, often in large patches. Stubby or very reduced root system. Roots with dark lesions on the surface or within. Severely reduced viable stand-life.	Paddock selection/ improved irrigation/ drainage management. Good crop rotations. Use of resistant cultivars.
	Bacterial wilt *Pseudopeziza medicaginis*  NSWDPI	Bacterial disease common in older varieties. May be spread by seed, hay, farm machinery etc.	Symptoms start to develop in stands from 2–3 years old as stunted and yellow, possibly with scorched leaf margins. Roots will be progressively affected by dark discolouration and plants eventually die.	Use resistant varieties. Farm hygiene. Seed from a reliable source.
	Anthracnose *Colletotrichum trifolii*  Alan Humphries, SARDI	Fungal infection spread by plant debris, rain or too tight crop rotations. Warm, moist conditions favour disease. Typically appears in crops after 1–3 years in intensive lucerne production areas where susceptible cultivars are used.	Wilted stems on individual plants or in patches, with characteristic 'hook' of upper stem. Pale brown-grey lesions with dark spots and dark borders at base of stems.	Use of resistant cultivars. Long cropping breaks. Reduced canopy humidity (mowing/ grazing) if warm-humid conditions persist.
	Rhizoctonia (canker / stem-blight) *Rhizoctonia solani*  Alan Humphries, SARDI	Fungus hosted by most pasture species, cereals and oilseeds. Infections start from small black sclerotia on dead plant material. Sclerotia germinate under moist, warm conditions and infest a host.	Stand may slowly thin over a number of years to become unviable. Seen as a dark canker or girdling of stems at or just below soil-line. Exacerbated by moist conditions and mechanical damage.	Use low-crown varieties that may reduce impact of grazing or machinery. Reduce canopy cover, and thus humidity under warm-wet conditions.
	Verticillium wilt *Verticillium albo-atrum*  William M Brown Jr - Bugwood.org	Fungal wilt disease hosted by wide variety of plants including potatoes, tomatoes, maple trees, brassicas and some nuts and fruits.	Wilting is usually the end-stage of the disease as the plant dies. Earlier disease progress may include leaf yellowing, plant stunting or internal stem staining.	Most modern varieties are bred to be resistant. Quarantine screening of imported material. Farm hygiene.
	Sclerotinia (crown and stem rot) *Sclerotinia trifoliorum*  Nigel Cattlin-Alamy	Fungal disease hosted by most pasture legumes. Dormant phase as black sclerotes. Cool, damp conditions in lush, dense crops are ideal for infection. Spread by wind, rain, plant litter etc.	Crowns and base of stems initially affected, causing wilting and death of plants. White mould on affected plant parts. Black sclerotes from within the stems and crown. Individual plants or whole stand may be affected.	Use seed from a reliable source, free of scerotes. Good cropping breaks between susceptible crops. Canopy management to reduce local humidity.

Alfalfa Preparation Checklist

Alfalfa preparation checklist

Question?	Yes	No – Action required
Alfalfa not grown in site for at least 2 years	✓	Crop for at least 2 years with alternative species.
Drainage OK. (casual water lays < 1 day)	✓	Improve drainage or select alternative site.
pH ($CaCl_2$) > 5.4	✓	Increase pH through liming or select alternative site or, if pH is 5.0-5.4, use SARDI Seven series 2.
Exchangeable Al^{3+} < 5%	✓	Decrease aluminium at depth through liming over a number of years or select alternative site.
Weed burden previously reduced	✓	Crop for 1–2 years with cereals or other grain crops, paying attention to weed control.
Irrigation available	Spring sow	Autumn or early spring sow.
Winter active variety (dormancy rating >6)	Autumn or spring sow	Spring sowing recommended in winter cold areas, for winter dormant varieties.

Alfalfa sowing rates

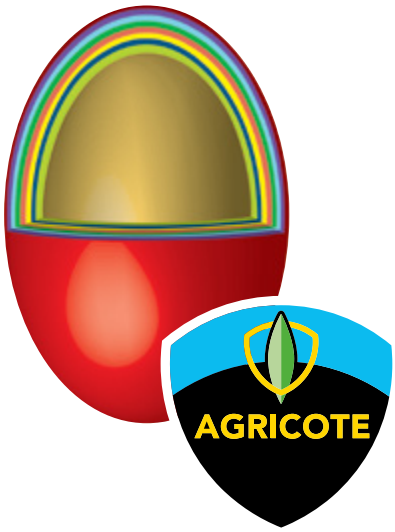
Annual rainfall	Marginal dryland (350 mm – 450 mm)	Dryland (450 mm – 600 mm)	Favourable dryland (600 mm – 800 mm)	High rainfall/irrigated (800 mm+/ irrigated)
kg/ha	4 – 6	6 – 8	10 – 15	18 – 35

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.

Seed Coating

Using coated seed when sowing alfalfa has become the accepted best practice in Australia for many years.

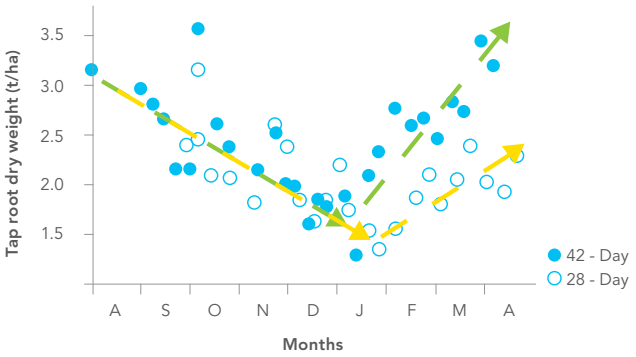
Alfalfas are available from Barenbrug with the proprietary AgriCOTE seed coating technology. AgriCOTE is designed to deliver enhanced seedling establishment through the inclusion of growth promotants, essential micro-nutrients and fungicide seed protection. In addition, AgriCOTE provides seedlings with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



Further Alfalfa Management Tips

Root reserves

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 (approximately 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.



Alfalfa tap root mass under two defoliation regimes, showing little if any difference in late winter-spring-early summer, but important to recharge root mass in autumn with a rest phase.
From Moot et al, Lincoln University 2003

Factors to aid Alfalfa persistence

Variety	Use a reputable variety of suitable dormancy, pest and disease tolerance appropriate to the farming system.
Initial plant density	Sow and establish sufficient seed to create a strong population: Preparation, sowing rate, sowing method, crop protection
Maintain fertility	Ensure fertiliser program adequately reflects crop removals and soil factors
Maintain soil pH	Monitor for and respond to any potential increase in soil acidity
Harvest timing	Ensure that the crop is being harvested before the new buds on the plant's crown may be damaged or removed through harvest operations
Grazing management	Ideally, move in the direction of adopting management and stocking rates to defoliate the crop within 2-3 days, then allow a re-growth period prior to the next grazing. GT varieties will be more resilient of longer grazing duration, but will also require periods to allow recovery.
Crop protection	Monitor and respond to weed and pest challenges
Irrigation	Ensure irrigation properly supplements rainfall to ensure yield targets are met
Autumn recharge	Allow the crop a rest period in mid-late autumn: carry a strong stand into winter, and it will be a strong stand next season. A weak stand entering winter will be a poor paddock next year.

Increasing plant numbers in a thin stand

After an alfalfa stand has been established for a year or two, there often 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 alfalfa 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. Options may include ryegrasses, forage oats, chicory, clovers or cocksfoot (orchardgrass).

Terminating an alfalfa stand

If it is necessary to terminate an alfalfa stand, glyphosate, clopyralid, dicamba or triclopyr + picloram can be used. For best results, this should occur when the alfalfa 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.

For enquiries relating to our products please contact Barenbrug's International Sales and Marketing team:

Colin Grant
Commercial Manager
T: +61 403 465 515
E: cgrant@barenbrug.com.au

Robert Hedge
International Sales & Marketing Manager
T: +61 421 585 644
E: rhedge@barenbrug.com.au

Kathy Gray
International Sales and Marketing
T: +61 429 532 210
E: kgray@barenbrug.com.au

Jason Burnie
International Sales and Marketing
T: +61 408 655 220
E: jburnie@barenbrug.com.au

BARENBRUG