

Heritage**seeds** 

SEED GUIDE

EDITION FIVE



**INSIST
ON THE
YELLOW
BAG**

Heritage**seeds** 





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INOCULANT

Inoculant (rhizobia) group recommended to inoculate the cultivar in order to achieve successful nodulation and nitrogen fixation.



MINIMUM ANNUAL AVERAGE RAINFALL (mm)



pH RANGE

pH range that can be used as an indicator for the suitability of a cultivar. The pH referred to is for a suspension of 1:5 soil: 0.01mol calcium chloride (CaCl₂).



PREFERRED SOIL TYPE



PASTURE GRASSES



PASTURE LEGUMES



PASTURE BLENDS AND MIXES



LUCERNE



FORAGE BRASSICAS AND HERBS



VETCH



FORAGE CEREALS



TROPICALS



TRADED VARIETIES



TURF AND LAWNS



SEED TECHNOLOGY



FIELD CROPS

The information presented in this publication is offered in good faith, based on seed industry data and relevant advice. Every effort has been made to ensure accuracy and freedom from error. Heritage Seeds, its agents or advisors accepts no responsibility for any loss or actions arising from viewing the publication's content.

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ABOUT HERITAGE SEEDS

HERITAGE SEEDS LEADER IN RESEARCH AND DEVELOPMENT

Heritage Seeds is a leading Australian seed company specialising in research and development, marketing, extension and distribution of proprietary pasture and forage seeds, cropping, turf and seed enhancement technology.

Our extensive range of products contains more than 100 seed varieties to meet the needs of our customers both domestically and internationally.

Significant investment is made each year, both internally and with our research and development partners, in order to develop and commercialise new varieties. To ensure our products are fit for purpose, they are rigorously tested at our research sites at Howlong, New South Wales and Gatton, Queensland and across many satellite locations throughout the country.

High quality seed is critical to Heritage Seeds in providing farmers with high performance products to improve productivity and maximise profitability.



PASTURE SELECTION

Pasture Renovation and Forage Production

No matter what type of stock you are running, you need pastures that will deliver. With the right pasture for your situation, you can achieve quality feed with rapid establishment. This will enable you to keep your options open and concentrate on making every stock unit count and maximise your profits. Whether you are growing winter lambs, dairy cows, prime beef or perhaps all three, you will get more out of every stock unit and grow profits with new pastures.

The simplest way to identify paddocks for renovation is to compare the production of all paddocks on your farm using your grazing records. If all the paddocks are the same size, simply add up the number of grazings/year for each paddock. If the paddocks are different sizes, you need to calculate grazings/ha. Don't forget to include hay or silage crops. By recording the stock type, number and duration of the grazing, you will be able to gauge the effectiveness of various paddocks in general or for specific times or purposes.

In many rotational systems pastures are grazed 10-12 times a year. Poor paddocks might give two less grazings than average, and four less than top performing new grass paddocks. A gain of two grazings from pasture renovation equates to 3-4t DM/ha and is highly economical. If the difference is larger, even bigger returns can be made.

In other systems there may be a requirement for set-stocking at certain times. The correct selection of pasture species to persist under high grazing pressure at key times and under seasonal stresses may be more critical than outright yield potential.

There is also scope to reflect on the age of pastures, even if they appear to be going fairly well. Plant breeders have been developing varieties with increasing yield potential as well as improved features including insect tolerance, growth at key times, tolerance of hostile soil conditions as well as increased overall annual pasture quality. Estimates have the rate of genetic gain by plant breeders in some species at around 1.0-1.2% per year. This could mean that your 20-year-old pasture is performing at only 20-24% of its potential and may be under-delivering to the farm's income potential.

PASTURE SELECTION

The success of a pasture or forage will depend on a number of factors including:

- Soil type
- Soil fertility/nutrient levels including pH
- Aspect
- Moisture – rainfall, timing, irrigation, dry periods
- Heat and cold
- Latitude/photoperiod
- Insect and other invertebrate pests
- Vertebrate pests
- Weed control options
- Stock type
- Paddock size, orientation, shape
- Water points, stock movements and similar
- Budget
- Species selection
- Cultivar selection
- Approach to pasture establishment
- Grazing management
- Fertility maintenance
- Maintaining weeds and pests below problematic thresholds
- The outcome being sought by the farming operation
- How the pasture fits in with other farming operations such as annual cropping or seasonality of animal enterprises
- Extreme environmental events.

Many of these factors can be addressed through appreciating the environmental potential and constraints; adopting good farming practices; understanding the levels of risk for reward, and by properly considering the need for inputs to enable a good pasture or forage to work properly and be maintained.

PASTURE SELECTION

It is useful to categorise various pastures and forage types into annual, short-term and perennial. In some cases a series of annual forages may be the best option for the long-term, or to play a role in a cropping or renovation program. Similarly there are excellent annual and short-term options for specialty forages and fodder as well as providing good stepping-stones towards a longer-term goal.

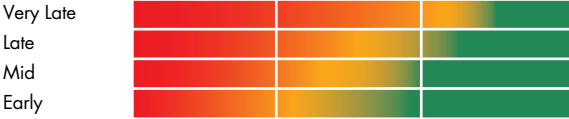
PASTURE TYPE	TYPICAL FEATURES	PURPOSES E.G.
Annual/ Seasonal 6-12 mths	Feed at key times	Cover a feed gap
	Rapid growth	Pasture renovation
	High yield	Silage/hay crops
	Good quality	Cropping break
	Single variety or simple mixes	Weed/pest control
Short Term 2-5 years	High performance	Cropping break
	Responsive to inputs	Mixed farming
	Yield at key times	High intensity operations/finishing
	Rapid paddock turn-over anticipated	Specialised seasonal production
Perennial 5 years +	Perennial grasses	Back-bone of grazing operations
	Perennial or self-regenerating legumes	Long pasture phase/cropping break
	Resilient and reliable	Fodder production
	Often multiple varieties/species	Best use for the site

This booklet will give you a guide as to particular species, possibly sub-types within species and appropriate cultivars that will meet those requirements in most circumstances. As a starting point, the following pages contain charts that indicate the suitable rainfall environments and applications for the majority of the important pasture and forage species in temperate Australia.

PASTURE SELECTION

Typical Annual Rainfall Range			Winter Dominant					
350	400	450	500	550	600	650	700	750+
Sheep, Beef, Wool Dry Extensive			Mixed Grazing Good Extensive			Finishing / Dairy Intensive		

Perennial and Hybrid Ryegrasses



Phalaris



Cocksfoot



Tall fescue



Bromes



Perennial clovers



Sub-clovers



Lucerne



Medics



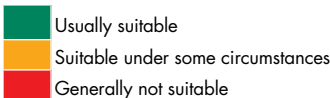
Chicory















































Plantain



Key:



PASTURE SELECTION

Irrigation	Hot, Dry Summers, Days often >32°C	Varieties	Page
		Bealey, Shogun	23, 26
		Impact 2, Viscount	24, 23
		Arrow, Rohan	25
		Kidman, Barberia	25, 27
		Holdfast GT + others	36
		Australian	126
		Kasbah	39
		Howlong	39
		Safin	39
		Prosper	42
			
		Bareno	43
		Storm, Weka	47, 48
		Tuscan	48
		Palestine	127
		Campeda + others	52
		Monti + others	53
		Antas + others	54
		SARDI varieties	83-85
		Sultan-SU, Scimitar	61, 62
		Commander	93
			

PASTURE SELECTION

ANNUALS/SHORT-TERM AUTUMN PLANTING


















	Desired Use				
	Autumn Feed Gap	Winter Feed Gap	Silage	Hay	Summer Feed Gap
Ryegrass					
Annual - Early	Green	Green	Green	Green	Red
Annual - Mid-late	Green	Green	Green	Green	Red
Annual - Late	Green	Green	Green	Green	Orange
Annual - Very late	Green	Green	Green	Green	Orange
Italian - Diploid	Green	Green	Green	Green	Orange
Italian - Tetraploid	Green	Green	Green	Green	Orange
Annual clovers					
Arrowleaf	Red	Orange	Green	Green	Orange
Balansa	Red	Orange	Green	Green	Orange
Persian	Red	Orange	Green	Green	Orange
Forage cereals					
Oats	Green	Green	Green	Green	Orange
Barley	Green	Green	Green	Green	Orange
Triticale	Green	Green	Green	Red	Red
Ryecorn	Green	Green	Orange	Red	Red
Vetch					
Common	Red	Orange	Green	Green	Red
Woolly pod	Red	Orange	Green	Green	Red
Brassicas					
Forage rape	Green	Green	Orange	Orange	Orange
Leafy turnip	Green	Green	Red	Red	Orange

Key:

- Green: Usually suitable
- Orange: Suitable under some circumstances
- Red: Generally not suitable





PASTURE SELECTION

Cold
Winters,
Soil temp
<8°C for
winter

	Suitable Varieties	Page
	Grassmax™	32
	Vortex	32
	Arnie	32
	Hogan	31
	Hulk, Tempo	30
	Aston	29
	Zulu II, Cefalu	59
	Vista, Frontier	56
	Laser + others	57
	Mammoth + others	102
	Dictator 2	104
	Crackerjack 2	103
	Ryecorn	104
	Morava + others	96
	Capello + others	95
	Interval, Leafmore	88
	Falcon	90











PASTURE SELECTION

ANNUALS/SHORT-TERM SPRING/SUMMER PLANTING

	Desired Use				
	Summer Feed Gap	Autumn Feed Gap	Winter Feed Gap	Silage	Hay
Grasses					
Italian - Diploid	Orange	Green	Green	Green	Green
Italian - Tetraploid	Orange	Green	Green	Green	Green
Millet	Green	Orange	Red	Green	Green
Forage sorghum	Green	Green	Orange	Green	Green
Chicory					
	Green	Green	Orange	Green	Red
Brassicas					
Forage rape	Green	Green	Green	Orange	Orange
Leafy turnip	Green	Green	Orange	Grey	Red
Turnip	Green	Green	Green	Grey	Red
Swede	Red	Green	Green	Grey	Red
Kale	Red	Green	Green	Orange	Red
Key:					
	Usually suitable				
	Suitable under some circumstances				
	Generally not suitable				
	Generally not applicable				

PASTURE SELECTION

Hot, Dry
Summers,
Days
often
>32°C

	Suitable Varieties	Page
	Hulk, Tempo	30
	Aston	29
	Pearler	107
	Astro, Centaur	106
	Commander	93
	Interval, Leafmore	88
	Falcon	90
	Dynamo	89
	Invitation	91
	Caledonian	92

PASTURE SELECTION

Managing a pasture is just as important as choosing the right seed. Our highly experienced team of territory managers can offer valuable and timely advice to guide farmers, agronomists and retailers in making the right decisions.

Heritage Seeds' Territory Managers have an intimate knowledge of the eco-agricultural aspects of their area plus the resources and back-up from regional agronomists and technical support from research, seed production and plant breeding nationally and internationally.

Your Territory Manager can offer guidance on such things as:

- Pasture and crop economics
- Crop sequencing
- Paddock selection and preparation
- Fertiliser
- Weed and pest control
- Grazing management
- Animal production and health issues
- Fodder conservation
- Lawns and turf
- Winter grain and summer grain crops
- Temperate and tropical species
- Seed treatments.

Contact details for your Heritage Seeds Territory Manager are located on the back cover.

PASTURE SELECTION

Heritageseeds 

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GROW WITH CONFIDENCE
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PASTURE GRASSES

The broad family of grasses contains around 10,000 species, and examples are found in almost all climates. Included are wheat, barley, rice, millet, maize, bamboo, sorghum, sugar cane which all play important roles in food production, energy, manufacturing and structural materials. By far the most dominant sub-group in terms of land area are the pasture grasses which provide food for animals, resulting in outputs such as meat, milk, cheese, wool, hides, other animal products as well as leisure and amenity.

The main pasture grass species for temperate Australia are described in this chapter: ryegrasses which are versatile and productive over a range of climates and production systems, particularly in areas with cooler/milder summers; and hardy perennial species such as phalaris, cocksfoot and tall fescue which will often be better or complementary choices in areas with tougher climates or other challenges.

In the main, grasses provide the bulk of animal feed in pasture systems offering energy, protein, fibre and other vital nutrients. Usually some sort of pasture legume base is included with grass species in order to provide nitrogen for the pasture system as well as a feed source and diversity.



Ryegrasses

There are four main groups of ryegrass:

Perennials

For typically 5 - 8 years plus, but may only last a few years under some conditions. These work best in areas with a more distributed rainfall pattern or irrigation and milder summers where they form the basis of a long-term pasture feed-base.

Hybrids

Life-span 2 - 5 years depending on the variety and the circumstances. Work well where multiple years are required with very good autumn and winter growth, and the persistence of true perennial ryegrass may be unreliable. Also excellent for over-sowing.

Italians

18 months - 2 years under favourable conditions although typically one year under most Australian systems. A popular option in areas where late spring growth is reliable, or where summers are mild and a second year may be required. Very useful for over-sowing into existing pastures as a boost for a year or two.

Annuals

8 - 11 months when autumn sown. Annuals are popular in areas with winter dominant rainfall and dry, hot summers, or for a quick winter feed prior to spring cropping.

All ryegrass will propagate from seed however, the more perennial characteristics the variety has, the greater its ability to self-regenerate from vegetative daughter tillers.

True annual ryegrass does not have this ability, whereas true perennials have a large capacity to reproduce through tillering. Therefore as the capacity for vegetative tillering increases, the potentially longer-lived the plant. Italian ryegrass and hybrids are intermediate types in this respect. In summer hot and dry situations, vegetative tillering will be reduced or non-existent, hence perennial ryegrass may not persist well enough to be an option.

PASTURE GRASSES

Ryegrass Heading Dates

This term refers to the relative maturity of a variety: when the grass becomes reproductive and sends up flowering tillers. As a rule, the earlier the heading date, the more late winter growth potential and the more pronounced the spike in spring growth.

DRY TOLERANCE SUMMER DORMANCY ↕ RESPONSIVE TO SUMMER MOISTURE	Very early	EARLIER, LARGER SPRING FLUSH ↕ MORE EVEN SPRING GROWTH
	Early	
	Mid season	
	Very late	

Early heading types are more suited to areas where the spring conditions may become hot and dry early. Once they have run to head they will typically stop producing unless there is follow up moisture. This is a useful survival strategy for ryegrass in drier extensive grazing areas. Once a grass starts to become reproductive and runs to head, the relative pasture quality is reduced as the plant accumulates more cellulose and lignin. Stalky pastures with lower proportion of leaf have reduced quality, and animal performance can be reduced.

Conversely, it is typical for late heading date varieties to exhibit relatively less winter growth, although this is now changing with some of the newer late varieties offering very good winter yields. Later varieties have a longer but steadier spring flush thus allowing for greater flexibility and extended pasture quality into early summer.

PASTURE GRASSES

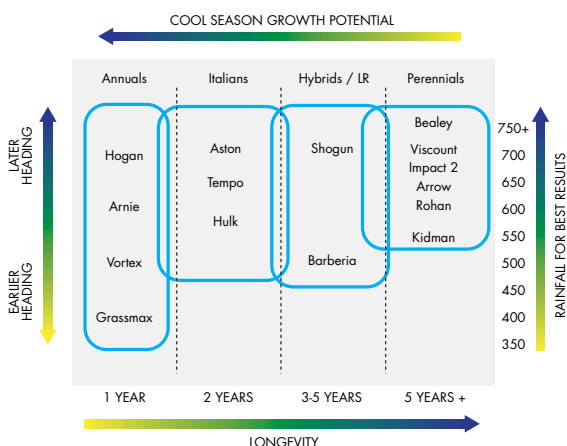
It is often beneficial to have a range of heading dates on farm:

Early varieties:

- Suit paddocks or locations that typically finish earlier e.g. north facing, lighter soils
- Maximise the potential from rain-fed (dryland) production with an early spring flush
- Likely to complement later paddocks by providing comparatively more feed in late winter/early spring
- Allow for allocation of paddocks for fodder conservation, with later paddocks being grazed
- Often can be considered for sites with shorter growing seasons or where lower input costs are justified.

Later varieties:

- Suit sites where the spring season holds on longer
- Offer higher feed quality and animal performance, over an extended period
- Maximise the potential value from summer irrigation or moist summer conditions
- Potentially spreads the silage/hay season risk and workload
- More usually suited to sites where higher outputs are being targeted
- Often considered more easily managed to maintain spring and summer quality.

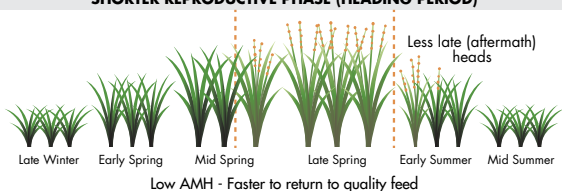


PASTURE GRASSES

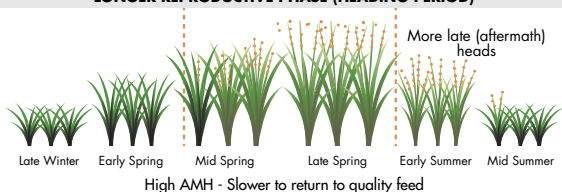
Aftermath Heading

Increasingly, ryegrasses are selected to have as narrow a heading period as possible. For example, they are selected to run to head all at once, and then stop. This is termed 'low aftermath heading' (AMH). If a variety has an extended flowering period, then the quality of the pasture is lower for a longer period due to the stalk content.

SHORTER REPRODUCTIVE PHASE (HEADING PERIOD)



LONGER REPRODUCTIVE PHASE (HEADING PERIOD)



This explains part of the persistence of older type ryegrasses in some more mature pastures: it is not the original plant that survives, but the capacity for the stand to re-seed over a long flowering period, with lax grazing or through hay cutting. Nowadays, grass is more often conserved as silage, less frequently taken for hay and varieties are generally selected for low AMH. This means that to obtain true long-term perenniality, the grass must be managed to reproduce from its tillers. This can be encouraged by selecting the right variety for the conditions. This includes good grazing management particularly in spring, appropriate fertility, and not grazing when the paddocks are going through stress such as drought or waterlogging.

Ryegrass Ploidy: Diploid and Tetraploids

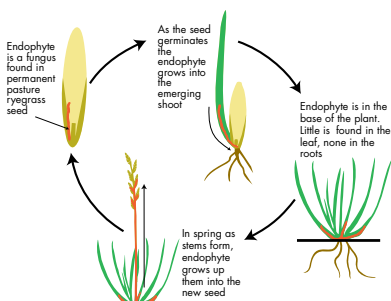
Ryegrass is naturally a diploid, meaning it has two sets of chromosomes. Some varieties are tetraploids: artificially developed by plant breeders to have four sets of chromosomes. This practice was first developed in Holland in the 1960s and has since become common in plant breeding. The practice does not involve gene modification. Tetraploids have larger seeds (nearly double the size of standard diploid types), and because of this a higher sowing rate is required. Plants of tetraploid varieties are also larger with wider, darker leaves, lower number of tillers, and fewer, but thicker roots. Tetraploiding in perennial ryegrass has been found to increase palatability and can increase feed value.

	DIPLOIDS	TETRAPLOIDS
Features	• Smaller seed size	• Larger seed size
	• Finer leaves and stems	• Broader leaves and thicker stems
	• Often paler green colour	• Usually bright, dark green
	• Finer root system	• Fewer, thicker individual roots
	• Greater number of tillers per plant	• Fewer tillers per plant
Benefits	• Generally higher drought tolerance	• Often have greater stock acceptance
	• Greater pugging tolerance in wet environments	• Usually grazed low, allowing higher clover percentage
	• Lower sowing rates, lower cost per hectare	• Generally lower fibre, higher ME
Disadvantages	• Often slightly higher fibre, lower ME, although with new plant breeding this is no longer necessarily the case	• Higher sowing rates required
		• Less tolerant of lengthy dry periods
		• Less tolerant of pugging and traffic
	• Growth habit of some cultivars so dense as to be poor companions for clover	• Will often offer less than ideal levels of fibre at key times e.g. early spring
		• Easily over-grazed

PASTURE GRASSES

Ryegrass Endophyte

Ryegrass endophyte can contribute to pasture persistence and animal performance. An endophyte is a fungus that lives naturally in a plant. In the wild and cultivated areas there are many different grasses and endophytes, often they have a special and unique symbiotic relationship with each other. The grass offers the fungus nutrient, a home and a method of multiplication and dispersal. The fungus gives the plant some protection from pests and over-grazing, by producing alkaloid chemicals that perform insecticidal and anti-feeding functions, thus helping the plant's survival.



Endophyte life-cycle. The endophyte transfers with the seed or with harvested material. Silage or hay made from high endophyte pastures will still contain the toxins.

Naturally occurring ryegrasses usually contain endophytes that produce fairly high levels of these chemicals in the plant at certain times of the year, most notably when seed heads are developing in late spring, and in early autumn when coming out of summer dormancy. Ideally we want the pasture to have the plant-survival characteristics that normal endophyte offers, but without health effects or production losses. In some situations though, particularly where animals are being very intensively produced, the staggers and heat stress issues affect the economic performance of the farm to a point where other options should be considered and carefully taken up.

There are several endophyte options currently available in Australia. Each has its own characteristics, so it is important to understand the difference between them and which farm situations they are best suited to. It is also important to reflect that the endophyte is only one feature of a cultivar, and genetic potential, resilience of the cultivar itself, and pasture fertility and management will have a great bearing on performance and persistence.

Ryegrass Endophyte Options

NEA / NEA2 – An ideal endophyte for intensive farming situations through temperate Australia. It provides excellent control of most insects, including Argentine stem weevil, black beetle and root aphid, giving a level of protection that is well proportioned to the levels of insect pressure in Australia. NEA2 also provides excellent animal performance and staggers-free pasture. Available in tetraploid and diploid varieties.

AR1 – A suitable endophyte for most medium to high rainfall farming situations throughout southern Australia. It provides very good resistance to many insects, and good persistence in many regions of southern Australia when matched with superior ryegrass varieties. AR1 also gives excellent animal performance and health with no chance of ryegrass staggers. This endophyte may not be suitable for areas where black beetle is a problem.

Endo5 / AR5 – Endo5 provides staggers-free pasture, although it may slightly reduce live weight gain in lambs. Currently the only commercial cultivars with Endo5 are tetraploid varieties. Does not appear to control root aphid to the extent of NEA2.

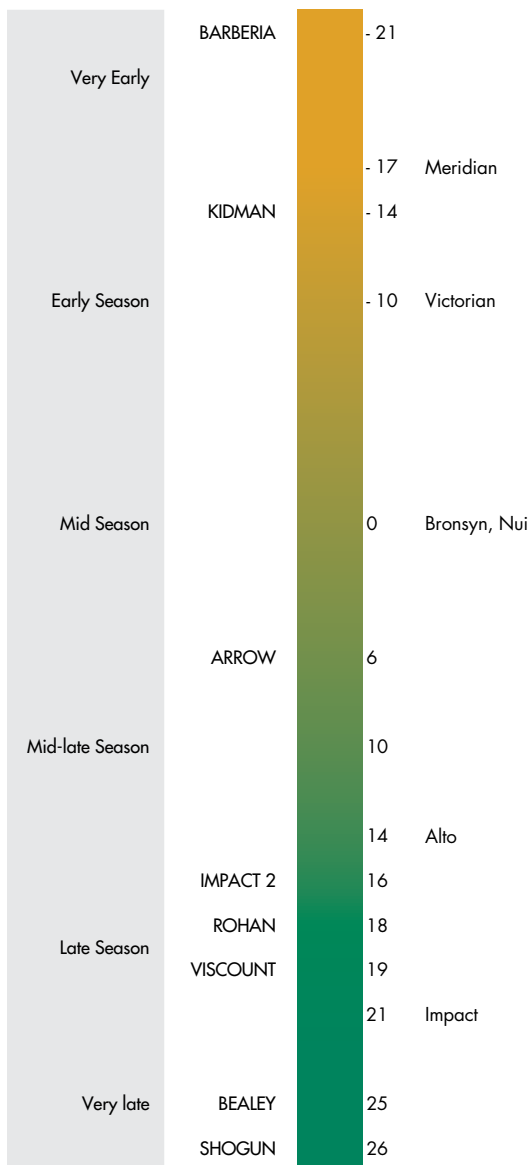
AR37 – Provides high overall insect resistance and is suitable for situations where pest pressures are high. It can cause ryegrass staggers (although less often and usually less severe than standard endophyte) and can impact animal production. It is not recommended for deer or horses and caution is needed when grazing with sheep.

Standard endophyte (SE) – Not recommended for sowing in most situations. Standard endophyte is more likely to cause staggers when appropriate conditions prevail for alkaloid production, and can significantly reduce lamb growth, beef production and milk production in dairy cows. Not recommended for horses. Has contributed to concerns with animal welfare on occasions. Also called High Endophyte (HE), Wild-Type (WT). Not available in varieties with high production potential.

Without endophyte (WE, Nil) – Removing endophyte eliminates any animal health problems, but insect resistance is also lost and ryegrass pastures rarely persist well as a result.

PASTURE GRASSES

Perennial and Hybrid Ryegrasses



Perennial and hybrid ryegrass heading dates

PASTURE GRASSES

Perennial ryegrass

15–30kg/ha

Lolium perenne

In the higher rainfall and irrigated regions of southern Australia, perennial ryegrass is the grass of choice for permanent pastures. It is relatively easy and quick to establish and easy to manage, although it struggles under high summer temperatures and needs appropriate management to ensure long term persistence.

- Establishes rapidly, yields well, tolerates a range of management practices and has high feed value.
- It is compatible with a range of legumes offering an excellent all round pasture for grazing systems.

Heritage Seeds' ryegrasses with endophyte technology and staggers free are now readily available.

BEALEY NEA2 PERENNIAL RYEGRASS

Very Late Tetraploid



700+ mm 4.8 – 8.0 Most soil types

- True perennial ryegrass
- Very late flowering (+25 days)
- Preferred choice for highest production systems
- Excellent winter and summer growth
- Highly palatable tetraploid
- Long term persistence
- NEA2 endophyte:
 - Good insect tolerance
 - No staggers.

VISCOUNT NEA PERENNIAL RYEGRASS



650+ mm 4.8 – 8.0 Most soil types

- New release
- True perennial ryegrass
- Late flowering (+19 days)
- Improved autumn, winter and early spring growth
- Excellent winter and summer growth
- Highly palatable tetraploid
- Long term persistence
- NEA endophyte:
 - Good insect tolerance
 - No staggers.

PASTURE GRASSES

IMPACT 2 ^{NEA2} PERENNIAL RYEGRASS

Late Diploid



650+ mm 4.8 – 8.0 Most soil types

- Diploid late (+16 days) perennial ryegrass
- All season growth pattern (unheard of before)
- Excellent persistence
- Productive high yield
- Quality forage: Production with persistence
- Released as Trojan in New Zealand
- NEA2 endophyte:
 - Excellent insect tolerance
 - No staggers.

NEA ENDOPHYTES

The NEA series of endophytes have come through with the breeding of a family of ryegrasses. The particular ryegrass genetics are to a large extent the natural host of NEA, thus conferring some good symbiotic benefits to the varieties in the breeding program. NEA2 is a mixture of endophyte strains and is available in both diploid and tetraploid cultivars.

The alkaloid profile and expression is determined by the interaction with the host cultivar and the levels of the various strains within the variety. Expression of alkaloids appears generally to be stronger in diploid grasses as a rule. NEA2 will express very low levels of lolitrem B, low levels of ergovaline and standard levels of peramine. This balance of alkaloid offers good insect resistance and excellent animal performance.

NEA and NEA2 endophyte offer the following benefits:

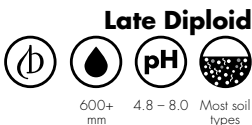
- Good levels of insect protection: Argentine stem weevil, black beetle, root aphid
- Freedom from ryegrass staggers
- Excellent animal acceptance and performance
- Available in well adapted, high-performance cultivars for a range of applications.

NEA2 endophyte has been used in various varieties in Australia since the late 1990's. In Australia, staggers have never been reported in any class of grazing animals, with excellent animal acceptance and performance in all seasons. NEA is the singular strain of the NEA2 complex that is present in Shogun and Viscount.

The NEA type endophytes continue to be developed and more varieties are expected to be released as breeding and field testing continues.

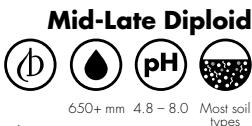
PASTURE GRASSES

ROHAN NEA2 PERENNIAL RYEGRASS



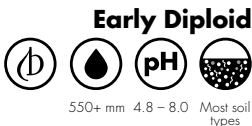
- Diploid late (+18 days) perennial ryegrass
- Fine, dense spreading habit
- Excellent persistence
- Productive in tougher environments under close grazing
- Improved resilience to treading/pugging
- NEA2 endophyte:
 - Excellent insect tolerance
 - No staggers.

ARROW AR1 PERENNIAL RYEGRASS



- Mid-late flowering diploid (+6 days)
- Improved late winter-early spring and summer growth
- Low aftermath heading
- True replacement and improvement over Bronsyn
- AR1 endophyte:
 - Insect resistance
 - No staggers.

KIDMAN AR1 PERENNIAL RYEGRASS



- Early flowering (-14 days) perennial ryegrass
- High autumn, winter and early spring production
- Good persistence and plant pulling resistance
- Low aftermath heading, quickly return to high quality feed
- New generation alternative to older Victorian types
- Selected in Australia specifically for our growing conditions
- AR1 endophyte:
 - Insect resistance
 - No staggers.

PASTURE GRASSES

Hybrid ryegrass

Lolium hybridum

15 - 30 kg/ha

Hybrid ryegrasses tend to fall between Italian and perennial ryegrasses in growth and persistence. They provide better winter production than perennial ryegrass and are best used in mild summer areas where they may persist for 3-5 years. Hybrid ryegrasses are generally produced by plant breeders crossing Italian ryegrass with perennial ryegrass. Plant breeding for this category may be directed towards either a high percentage of Italian or alternatively a high proportion of perennial parentage. This results in a great range of hybrid types available, with varying levels of merit for longevity or performance. Consider that well developed hybrid ryegrasses may offer one or two years' worth of extra longevity when compared to an Italian ryegrass under similar circumstances. As hybrids are often used under intensive input/output production systems, good management and fertiliser practices need to be applied for best results.

SHOGUN 
HYBRID RYEGRASS

Very Late Tetraploid



650+ mm 4.8 - 8.0 Most soil types

- A true break through in grass breeding
- Very late flowering (+26 days)
- Exceptionally high yield potential, matching the best Italian ryegrasses
- High winter growth and good summer production
- Excellent feed quality
- Improved persistence over other hybrid ryegrasses
- Grows like an Italian and persists for multiple years
- Ideal for over-sowing run-down pastures
- Suited to farm systems requiring exceptional autumn, winter and summer performance
- NEA endophyte:
 - Good insect tolerance
 - No staggers.

PASTURE GRASSES

Barberia ryegrass

10 – 20 kg/ha

Lolium spp.

Barberia was selected from a unique, isolated ryegrass population in northern Africa. Genetically, it is distantly related to Italian ryegrasses, but is considered in a category of its own due to inability to cross with other ryegrasses and its particular growing and reproductive characteristics. Barberia offers around 85-90% of the winter growth potential of good Italian ryegrasses, with the ability to remain properly summer dormant and offer multiple years of good production. Barberia is an excellent choice for producers in summer dry areas who need a 3-5 year pasture option. Barberia is probably the most heat tolerant ryegrass available which also aids persistence in marginal ryegrass country. It does not contain endophyte, so is a good option for developing a productive, staggers free, reliable early-autumn pasture feed base.

Very Early Diploid

BARBERIA

HYBRID RYEGRASS



500+
mm

4.8 – 8.0

Most soil
types

- Very early flowering (-21 days)
- Very fast establishing
- Winter performance like an Italian
- Potential for persistence over 5 years+ (3-5 typical)
- Highly palatable, good clover companion
- Excellent option for autumn, winter and early spring feed
- Good heat tolerance
- A good choice where prairie grass may be considered
- Suited to over-sowing
- Endophyte free = no staggers.



PASTURE GRASSES

Italian and Annual Ryegrasses

Short-terms



Italian and annual ryegrass heading dates

PASTURE GRASSES

Italian ryegrass

Lolium multiflorum.

15 – 30 kg/ha

Italian ryegrass is used as a highly productive short term pasture option in areas with mild summers or where late season rains offer pasture growth into late spring and early summer. It is also well suited to over-sowing into run-down pastures and may be spring sown in areas where summer moisture is reliable. Some farming operations over-sow annually or biennially to maximise the benefits of strong cool season growth with late season quality. Italian ryegrasses are an excellent option for silage and hay production, often offering two or more cuts under ideal conditions.

Italian ryegrass can persist for 2-3 years in summer mild areas under irrigation or reliable summer rainfall. In summer dry areas it will continue to produce quality feed through spring and into summer, giving it an advantage over annual ryegrasses. Italian ryegrass should not be sown as part of a permanent pasture as it will compete with perennial species, then thin out over time allowing weed ingress.

Heritage Seeds' Italian ryegrasses will not cause staggers.

ASTON ITALIAN RYEGRASS

Late Tetraploid



650+ mm 4.8 – 8.0 Most soil types

- High yielding tetraploid Italian ryegrass
- High overall yield regardless of seasonal or regional variations
- Very fast establishment
- Consistently even seasonal growth pattern, offering reliable feed through the growing season
- Intermediate growth habit with a reasonably open sward
- Highly suitable for over-sowing.

PASTURE GRASSES

TEMPO

ITALIAN RYEGRASS

Late Diploid



500+
mm

4.8 – 8.0

Most soil
types

- New release
- Increased overall yield, autumn, winter and spring yield compared to industry standard varieties
- Very fast establishment
- Highly reliable – widely tested and consistent
- Grazing, silage, hay – all stock classes
- Highly suitable for over-sowing
- Will be the new benchmark in this category.

HULK

ITALIAN RYEGRASS

Late Diploid



500+
mm

4.8 – 8.0

Most soil
types

- Italian diploid ryegrass
- Developed in Australia
- Fast establishment with excellent winter – early spring yield
- Up to 10% higher yields than other Italian ryegrasses
- Upright variety for high utilisation
- Continues to produce high quality, leafy feed through spring
- Holds leaves off the ground even as yield builds up
- Very suitable for over-sowing.



PASTURE GRASSES

Annual ryegrass

20 – 30 kg/ha

Lolium multiflorum, *L. westerwoldicum*

Annual ryegrasses are sown for a high quality short-term winter crop, providing multiple grazings in winter and spring. Hence annual ryegrass is generally used for a 6-9 month winter crop prior to sowing a summer crop, or to make the most of a growing season rainfall where late season rain is unreliable. Annual ryegrass exhibits the greatest winter growth potential of all the ryegrass types.

Including annual ryegrass when sowing a permanent pasture is not generally recommended. These tend to die out, allowing weeds to take over. They also establish rapidly and compete strongly with perennial species.

Annual ryegrasses are a good option for fast winter feed, silage and hay production. They may also be used as a quick over-sowing option to extend the life of a run-down pasture for an extra season. Companion species may include forage cereals and annual clovers.

HOGAN

ANNUAL RYEGRASS

Very Late Tetraploid



600+
mm

4.8 – 8.0

Most soil
types

- New release
- Latest maturity annual available (+22 days)
- Very fast establishment for early grazing potential
- Excellent autumn/winter production plus strong late spring growth
- Good spring growth and rust resistance
- Good prospects for second cut or after-spring grazing
- Well suited to high production areas with good spring growth prospects.



PASTURE GRASSES

ARNIE

ANNUAL RYEGRASS

Late Diploid



550+ mm 4.8 – 8.0 Most soil types

- Late maturing diploid annual ryegrass
- Densely tillered, fine leaves and an upright growth habit
- Quick to first grazing
- Good spring growth and rust resistance
- Excellent autumn/winter production plus strong late spring growth
- Very useful for hay and/or silage
- Highly adaptable across a diverse range of environments.

VORTEX

ANNUAL RYEGRASS

Mid-Late Tetraploid



500+ mm 4.8 – 8.0 Most soil types

- Mid-late flowering
- Excellent autumn, winter and early spring growth
- Good quality
- Ideal for fast, cool-season feed, silage and hay
- Good heat tolerance
- Replacement for Maximus and T-Rex.

GRASSMAX™

ANNUAL RYEGRASS

Very Early Diploid



450+ mm 4.8 – 8.0 Most soil types

- Very early type for marginal ryegrass environments
- Vigorous winter growth – more productive than Tetila
- Good seedling establishment
- Ideal for winter grazing and silage/early hay production
- Fits well into winter ryegrass - summer forage crop system.

Other Ryegrasses

Wimmera ryegrass

Lolium rigidum

Wimmera is still occasionally used as a hardy, cheap annual feed. It has the ability to set and regenerate seed readily and suits some areas with a short winter growing season. Wimmera is common in low rainfall areas with opportunistic pastures that are usually summer dry. Wimmera tends to be the main ryegrass weed found in cropping rotations and is the host of *Anguina* nematode that can lead to a livestock illness Annual Ryegrass Toxicosis (ARGT). Wimmera is rarely recommended for pastures in modern times.

Festulolium

x Festulolium

This term is loosely applied to varieties that are the result of crossing ryegrass with various types of fescue. In practice festulolium varieties are managed in the same manner as respective ryegrass types. Italian, hybrid and perennial analogues are available, however there is emerging evidence that the proportion of fescue component is relatively small and potential benefits seem at best marginal or indeed rarely manifest.



PASTURE GRASSES

Hardy Perennial Grasses

Phalaris

Phalaris aquatica

Phalaris is a deep-rooted, vigorous perennial that is best suited to heavier soils, but will produce well on a range of soil types. Early released varieties were most suited to neutral and alkaline soils, although newer varieties have been developed to produce well in more acidic conditions. Phalaris has some tolerance to salinity and is very tolerant of periods of water-logging. It is relatively resistant to cockchafers and corbie grubs.

Establishing a perennial pasture based on phalaris will improve farm productivity compared to systems relying on annual grasses. Nitrogen produced by pasture legumes, usually grown with annual grasses, leaches down through the soil profile, taking nutrients with it, leaving acidic elements behind. The deep-rooted perennial nature of phalaris draws these nutrients back up to help prevent or slow down the onset of acidification. Another major benefit of the deep-root system of phalaris is it improves persistence and productivity under drought conditions.

There are two main groups:

Winter active: summer dormant (to varying levels), more erect, more acid tolerant, suited to dryland and cattle;

Winter dormant: more prostrate often denser crown, neutral pH, suited to sheep, summer rainfall.

Phalaris has a small seed, reflected in the low sowing rate:
 3-5 kg/ha (as only/main grass)
 1-3 kg/ha (mixes with other grasses).

Typical companion species:

Sub-clover, white clover, strawberry clover, cocksfoot, fescue (and ryegrass if well executed).

	Soil Type		Rainfall Pattern		
	Light Skeletal Soils	Medium Heavy Soils	Winter Dominant, Short Spring	Winter Dominant, Longer Spring	Even distrib./ Some Summer Moisture
Advanced AT	Green	Green	Orange	Green	Orange
Landmaster	Green	Green	Orange	Green	Orange
Lawson	Orange	Green	Orange	Green	Green
Holdfast GT	Orange	Green	Orange	Green	Green
Australian	Red	Green	Red	Orange	Green

PASTURE GRASSES

ADVANCED AT PHALARIS

Winter Active



450+ mm 3.9 – 8.5 Most soil types

- Winter active phalaris with superior establishment and root penetration on acid soils, especially in tougher seasons
- Will tolerate pH CaCl_2 3.8 and $\text{Al}^{3+}\%$ of 20-50%, providing better production and persistence on these soils than other phalaris varieties, cocksfoots and perennial ryegrass, (CSIRO, 2007)
- Higher second year dry matter yield than Holdfast on acid soils (40-80% across all CSIRO trial sites) and higher than closest acid tolerant variety, Landmaster (36%)
- Suited to rotational grazing and improved fertility, regardless of soil acidity
- Best managed by rotational grazing
- Advanced AT gives producers with high acidity soils a productive and persistent pasture option that has not been previously available
- Advanced AT will increase productivity on highly acidic soils with aluminium content as well, although due to its broad breeding background will also produce well in soils of a pH above 4.0.

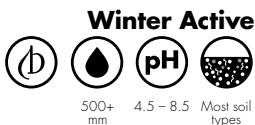
Key: Good option
 Often suitable
 Not recommended

	Grazing Management		Soil pH		
	Rotational	Lax / set-stocked	Very Acidic <4.5	Acidic 4.5 - 5.5	Neutral - Alkaline 5.5 - 8.5
Advanced AT					
Landmaster					
Lawson					
Holdfast GT					
Australian					

PASTURE GRASSES

HOLDFAST GT

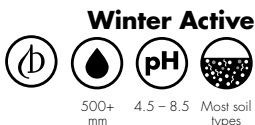
PHALARIS



- Grazing tolerant winter active phalaris bred by the CSIRO
- Exhibits excellent seedling vigour to aid successful establishment
- Selected for long term persistence under grazing (both set-stocking and rotational grazing)
- Increased productivity over the life of the stand
- Lower levels of stager causing alkaloids
- Its ability to grow in moderately acidic conditions increases its area of adaptation
- CSIRO released Holdfast GT as a grazing tolerant replacement for Holdfast. It has been bred from Holdfast and other winter active varieties. Once established, Holdfast GT can be set-stocked and will provide a productive long-term stand.

LAWSON

PHALARIS



- Semi-erect, winter active phalaris
- Shorter summer dormancy with better potential to respond to summer moisture resulting in valuable summer feed
- Superior summer and autumn production, late flowering, disease resistance and good grazing tolerance
- Equal rust resistance to Holdfast and Atlas
- Larger leaves and higher tiller density compared to varieties like Holdfast and Sirosa.



Phalaris Establishment and Management

Grazing of a newly sown pasture should be avoided until plants have become established. Grazing prior to effective establishment can cause plants to be pulled out reducing the population and pasture performance. Once established, phalaris will tolerate periods of set-stocking, although more erect varieties will benefit from good rotational grazing systems. Many older phalaris varieties have high levels of alkaloids which can cause phalaris toxicity (phalaris staggers). New varieties contain lower alkaloid levels in the leaves and therefore provide a safer grazing alternative. However, in areas prone to phalaris toxicity plants should be grazed cautiously in the autumn and early winter.

Phalaris can be grown with other legume or grass species to help reduce the risk of illness in livestock. Phalaris toxicity can affect sheep that are grazing on fresh growth after breaking rains. Stock are at the greatest risk when grazing on short, frosted plants, which mainly occurs during the autumn or the early winter period. To counter the potential problem, Cobalt bullets can be orally administered or by ensuring stock are not hungry when introduced to lush, green feed. The greatest risk to animals is when they are able to ingest a high level of herbage in a short period of time. Toxicity levels in the plant increases if plants are subject to stresses such as drought and frost.

Once stands are established it is recommended that the following be observed to maximise the benefits and persistence:

- Lime acid surface soils if CaCl_2 if needed/plausible, or use Advanced AT
- Apply superphosphate if Olsen P is 8-10ppm or less. Phalaris will respond well to higher P levels
- Graze winter active cultivars rotationally with 4–6 week spells in autumn–winter
- Do not graze too hard or too often after stem growth starts in spring, especially in a dry year
- Allow to produce seed heads in the first year, and at intervals in future years
- Flowering allows basal buds to be set for future growth.
- Clean up stem residues in summer to increase clover germination and growth
- Set stock after late spring to utilise feed and open the sward for clover growth
- Do not heavily graze new stems from summer regrowth.

PASTURE GRASSES

Cocksfoot

Dactylis glomerata

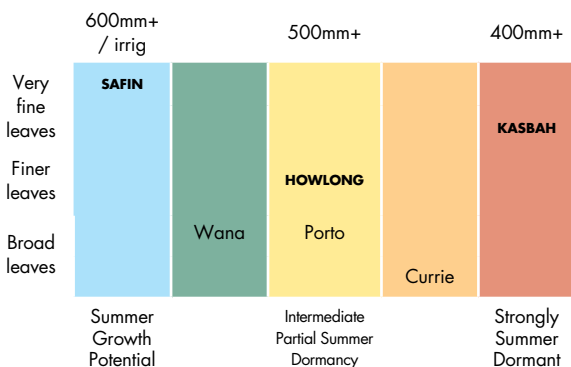
2-4 kg/ha in a mix,

6-8 kg/ha as dominant species

Cocksfoot is a tussocky, true perennial grass that suits lighter, well drained soils. It is the most acid-soil tolerant grass species and will produce well where many other grasses struggle to produce. Cocksfoot will also suit higher rainfall areas with free-draining, low pH soils e.g. granites and deep sands. It will perform best where reasonable fertility can be maintained and rotational grazing adopted, although cocksfoot pastures may be set-stocked for reasonable periods through spring if required. Cocksfoot does not contain any substances harmful to grazing animals.

Cocksfoot is slow to establish as the seed is small and light-weight. Cocksfoot is generally used in a wide range of rainfall areas from very low to very high, as a component in a pasture mix with clovers and other grasses. Higher sowing rates will result in the cocksfoot becoming dominant over time. It is generally used in extensive sheep and beef production, although there is scope for use within dairy systems.

Maintaining higher levels of soil fertility will help to increase production, persistence and feed quality. There are many varieties available, with some more noted for having a dense crown, and tolerant of drought and close grazing; others being less dense, more upright and better companions for clover. Cocksfoots are now available over a spectrum of summer dormancy, with the highly summer dormant Kasbah at one end, summer active Safin at the other and the intermediate Howlong in between. Plant breeding has also taken place to select for fines leaves, leading to increased overall stock acceptance.

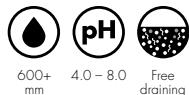


PASTURE GRASSES

Cocksfoot can be very persistent and become the dominant pasture if not carefully managed. Levels of cocksfoot in the pasture mix should be monitored as animal performance may decline if it becomes the dominating species. It is suggested that cocksfoots are used in mixtures with other grasses such as ryegrass, phalaris or tall fescue. Other companion species include lucerne, white clover, red clover, strawberry clover and sub-clovers.

SAFIN COCKSFOOT

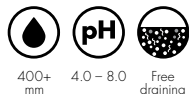
Summer Active



- Super fine leaved cocksfoot
- 40-50% higher tiller density than most other cocksfoots
- Increased early spring production with high total DM
- Suits lambing and calving patterns in medium rainfall dryland systems
- Reliable, palatable feed where summer rainfall is anticipated.

HOWLONG COCKSFOOT

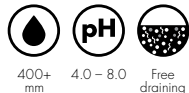
Intermediate



- Bred from Porto specifically for Australian conditions
- Improved autumn / winter growth
- Fine leaves and tillers
- Less likely to form clumps
- High total yield and good autumn winter growth
- More compatible with other species
- Versatile, hardy all-rounder.

KASBAH COCKSFOOT

Summer Dormant



- Hardy, deep-rooted perennial grass that is well suited to dry conditions and acid soils
- Good seedling vigour and early growth producing tillers
- Classed as a Mediterranean type (summer dormant), which is more tolerant of harsh dry conditions
- Maximum herbage production is during the autumn and winter period
- Excellent summer dormancy compared to other Mediterranean types.

Cocksfoot Grazing Management

Plants will benefit from light grazing during the first 6–8 months after an autumn sowing, provided the root system has developed adequately.

Light rotational grazing will encourage root development and allows it to compete with any legume which may have been sown as a companion species. If sowing with ryegrass, reduce the ryegrass sowing rate, and manage new pastures to ensure the cocksfoot can establish effectively. This may involve one or two initial on-off grazings with good monitoring.

In summer dry areas, avoid over grazing during the spring/summer period. If grazing with sheep, extra care must be taken through dry periods as they can damage young and established crowns due to cocksfoot's erect growth habit. Poor management will lead to reduced plant numbers and persistence.

Cocksfoot pastures grazed with sheep should be rotated frequently so as not to allow the sheep to continually graze close to the crown. Over grazing during this period, in combination with moisture stress, can cause the stand to thin out significantly and allow weed invasion. This is particularly the case for summer-dormant (Mediterranean) types such as Kasbah.

Intermediate types such as Howlong and Porto, due to moderate capacity for summer growth, will require some level of summer grazing pressure to be applied. If this is not done, plants may become tall and rank as the autumn period approaches, thus reducing the quality of the overall pasture.

Summer active types such as Safin are now being introduced to offer productivity in lower fertility areas subject to summer rain or complemented by irrigation. Safin may be readily grazed as part of a mixed pasture in a summer active sward.

PASTURE GRASSES

Tall fescue

10 - 15 kg/ha

Festuca arundinacea

Tall fescue is a very deep rooted, true perennial that is adapted to a wide range of conditions and soil types. It will cope well with waterlogging and has a degree of salt tolerance. Generally a pH of 5.2 or higher is needed for best long-term results, and it will respond to improved fertility. It will do best under medium to high rainfall or irrigation, although Mediterranean types will persist in summer dry areas. Tall fescue is very slow to establish, and care must be taken not to have it selectively grazed out of mixed stands in the first year. It is a good species to use as a pasture base to companion cocksfoot, phalaris and clovers. Stock acceptance may be slow initially when introduced from ryegrass pastures. Suits all stock classes. There are two fairly distinct sub-groups:

Mediterranean: Mediterranean cool season (winter) active, tall fescue is summer semi-dormant to dormant, giving improved persistence in summer dry regions. It is faster establishing than summer active tall fescue and has strong winter and spring production and fine leaves, maintaining better feed quality. It suits dryland, lighter soils and slopes.

Continental: Continental summer active tall fescue is a perennial grass more tolerant of hot summer, poorly drained and saline conditions than perennial ryegrass. In Australia, it is often sown under flood irrigation where high summer temperatures limit ryegrass growth or where summer rainfall is expected. It performs best on heavier soils, where its deeper rooting ability can utilise more soil moisture than ryegrass.



PASTURE GRASSES

PROSPER

TALL FESCUE

Winter Active



450+ mm 5.0 – 8.0 Most Soils

- Winter active forage tall fescue
- Fast establishing
- Truly summer dormant, excellent cool season growth
- Erect growth habit, with fine, soft leaves
- Rust resistant and is suited to summer dry environments
- Persistent and good legume companion
- Nil endophyte safe for all stock classes.

Brome Grasses

This group of several distinct species is large-seeded and varies from short-term to perennial in nature. They are mostly used on well-drained soil types of moderate fertility.

Brome grasses are usually sown as a sole stand, but could be used with cocksfoot, phalaris or tall fescue. One of the key attractions is that bromes contain no endophyte and do not create animal health concerns such as ryegrass staggers or phalaris toxicity. They remain nutritious and palatable when used as standing feed in summer. With inclusion of clovers, brome grass pastures are productive and useful for many stock classes.

Pasture brome

10-30 kg/ha

Bromus valdivianus

Pasture brome tolerates harder grazing than prairie grass and is suited to summer dry, well drained soils. It is more perennial in nature than prairie grass, and can be rotationally grazed or set stocked. It requires neutral pH, good drainage and reasonable fertility. In many respects pasture brome offers the grazing flexibility of prairie grass together with the persistence of a grazing brome. It is later heading than other brome grasses and offers higher quality feed over a longer period in the spring. Used in medium rainfall areas for longer-term mixed grazing.

BARENO PASTURE BROME

Hardy Perennial



550+ mm 5.4 – 8.0 Light to medium

- Standout permanent pasture for summer dry free draining soils
- Highly palatable, more persistent than other prairie grasses
- Can be rotationally grazed or set-stocked, flowers 19 days later than Gala, with better late spring quality and summer growth
- Supports a high legume content
- Improved summer yield and quality where ryegrass hays off
- Endophyte free.

Prairie grass

Bromus willdenowii

Prairie grasses are either annual or short-lived perennial brome grasses that offer excellent cool/winter season growth. Prolific re-seeders, they can be managed to create a more-or-less permanent stand, but often best used when a 2-3 year pasture phase is required.

Coloured brome

Bromus coloratus

Coloured brome is a longer-lived brome grass suitable for medium rainfall areas with moderate-good fertility. It offers reasonable quality forage and is predominantly summer active.

Grazing brome

Bromus stamineus

Grazing brome tolerates harder grazing than prairie grass. It is perennial in nature, and needs a neutral pH, good fertility, good drainage and close grazing management for best performance. As it is slow to establish and requires close management, it is best sown as a sole grass.

PASTURE GRASSES

Other Temperate Grasses

Tall wheat grass

10 - 15 kg/ha

Thinopyrum ponticum

Tall wheat grass is used in salty, wet areas for long-term management of salinity issues. It is often used to help prevent erosion in salt-affected areas and lower the water table. It has a reasonably large seed, but will grow into a large crowned-plant, so the sowing rate is more modest as a result. It can only offer fair quality feed, although can be useful sown in a mixed sward with other salt-tolerant species such as phalaris, tall fescue, sub-clover and strawberry clover. Best grazed in mid-late autumn after it has been growing and working through the spring and summer. It will be stalky and probably in seed-head, but the main purpose is to manage the salt and local water table issues.

Puccinellia

5 - 10 kg/ha

Puccinellia ciliata

Similar in use to tall wheat grass, puccinellia is a perennial grass used for salt affected areas. It will however tend to perform like an annual and dry off in hot summer conditions. It is less vigorous than tall wheat grass, and more difficult to establish, but probably offers higher quality and more palatable feed. Best sown in autumn and will be productive in autumn and spring. Mostly used in medium-low rainfall extensive sheep production.

Timothy

5 - 10 kg/ha

Phleum pratense

Timothy is a perennial species that has application as a specialty summer pasture in temperate, mild summer, high rainfall areas (>850mm). It also makes high quality hay, well regarded by many horse enthusiasts. Timothy competes quite poorly with other grasses, grows little in cold winter, and rarely persists under most typical grazing systems. Seed may be difficult to obtain in Australia as there are few systems or environments where Timothy will thrive.

PASTURE GRASSES



PASTURE LEGUMES

Pasture legumes are a cornerstone of most pasture systems and many cropping programs. This group of species includes perennial plants such as white, red and strawberry clover, and annual or short-lived species such as sub-clovers, aerial-seeded annual clovers, vetches and lucerne. Other species such as lotus, serradella and biserrula are also important in some parts of temperate Australia. Many temperate species transfer well into the sub-tropics although there are particular species that are developed for the warm-wet north including burgundy bean, cow pea and stylo.

Legumes are typically used in combination with grass and other species as part of a long-term pasture or a specialty forage, to provide nitrogen fixation, improved pasture feed quality and diversity of species for resilience. In some cases clovers, vetches, lucerne and tropical legumes may be used as a specialty stand-alone crop for specific outcomes such as high quality fodder, a break crop or simply as the best way to utilise a particular site.

Species and variety selection are important and sowing rates will vary depending on the situation. Sowing legumes with the correct grasses is a further vital consideration. Often a mixture of two or three pasture legumes will offer the best outcome. AgriCote treated seed contains the correct rhizobium strain as well as important trace elements and vital seedling protection.

For sowing a pure stand, typically multiply sowing rates by 2 - 3 times.



PASTURE LEGUMES

White clover

2 - 5 kg/ha (in a mix)

Trifolium repens

White clover is tolerant of, and persistent under a wide range of management systems and has a high feed value. Its ability to fix atmospheric nitrogen makes a substantial contribution to the growth of companion grasses. White clover will grow over a wide range of soil and fertility conditions although a pH of 5.4 or higher with reasonable phosphorus levels is required for good results. It has poor tolerance of drought conditions and is best suited to medium-high rainfall or irrigation, where it will respond well to spring and summer moisture.

White clover has relatively little winter growth, is slower to grow in the spring than ryegrass and is susceptible to shading. Spring management aimed at keeping pastures short and leafy is therefore important to maintain good clover content and to capitalise on its good growth and feed value in summer.

In white clover, a large leaf size generally means less stolons, but more potential yield. However a high stolon density and smaller leaf size means that there's better tolerance of adverse conditions, such as drought, pests, close grazing or pugging. It's important to select the right clover for the situation based on these attributes. Small-medium leaf size varieties will offer better persistence and often greater nitrogen fixation under sheep and extensive beef enterprises, whereas the larger leaf varieties are better suited to dairy and beef operations with good rotational grazing. It is often useful to use a smaller and a larger variety in a pasture blend.

STORM

WHITE CLOVER



Large Leaf

B or AgriCote

650+ mm

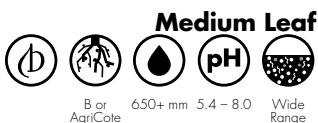
5.4 - 8.0

Wide Range

- Australian bred white clover
- Tall plant that can aggressively compete in a mixed sward with ryegrass
- Excellent seedling vigour and is quick to establish with very high yield potential across all seasons
- Stolon density of Storm is high compared to other large leaf types
- Persistent under cutting and remains dense
- High production in winter and summer.

PASTURE LEGUMES

WEKA WHITE CLOVER



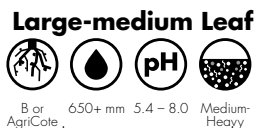
- Medium leaved white clover suited to all grazing systems
- Good growth in all seasons, particularly through autumn and winter
- High stolon growing point density
- High tolerance to clover root weevil
- Good growth in all seasons
- Sow in pasture mixes at 2-4kg/ha.

Red clover **3 - 6 kg/ha (in a mix)** *Trifolium pratense*

Red clover is a tap rooted, short-lived (2-5 year) perennial legume with high feed value. It has good summer growth and some drought tolerance, but little winter growth. It performs best on free draining soils under moderate stocking rates, long summer grazing rotations or hay production. Under high stocking rates or quick rotations its persistence is reduced. Summer moisture is required for best results. Red clover is commonly sown as a component of a permanent pasture, to boost late spring and summer growth and feed quality. It is often used as a specialist stand for hay or silage.

Red clovers contain phytoestrogens so care should be taken if feeding to breeding stock during mating (this mainly applies in the late summer and autumn periods when red clover is growing well). Phytoestrogen levels vary between red clover varieties.

TUSCAN RED CLOVER



- Bred for high yield with improved persistence under grazing
- Provides a source of excellent quality feed over summer and autumn
- Suited to most farm types in medium-high rainfall areas
- Improved persistence over other red clovers
- Smaller leaf size and relatively early flowering
- High yield as grazing and hay or silage
- Quality feed over summer
- Adds significantly to hay and silage quality.

Other Perennial Clovers

Strawberry clover 1 - 3 kg/ha (in a mix)

Trifolium fragiferum

Strawberry clover is very successful in areas where a long term, hardy pasture is required. It is especially useful in developed swamp country where soil types and drainage vary across a paddock. This is a true perennial clover that tolerates waterlogging and drought, and is suitable for neutral to alkaline soils, although it will survive in more acidic conditions. Strawberry clover is often used in slightly saline areas, as it is more salt tolerant than white clover and most sub-clovers. It is quite slow to establish, but will form a large crown in 2-3 years, and can become the dominant legume in a pasture sward. It is often used in extensive grazing areas as a component in ryegrass, tall fescue or phalaris pasture. It is very tolerant of close grazing by sheep and extensive beef once established.

Caucasian clover 3 - 5 kg/ha (in a mix)

Trifolium ambiguum

Caucasian clover can be a very persistent perennial clover, although the right type needs to be selected for conditions as there are great variations in growth habit and climatic suitability. It is generally better suited to elevated, medium to high rainfall areas with slightly acidic to neutral pH soils. It has a strong underground root system, and once established will grow well and persist under close grazing. Caucasian clover can be a useful component in a long-term cocksfoot or phalaris pasture, particularly in elevated areas under mixed sheep and beef grazing where summer rains are common.

Alsike clover

2 - 5 kg/ha

Trifolium hybridum

Alsike is a short-lived perennial clover that can be used in a similar fashion to red clover with the added feature of being able to tolerate and thrive in more acidic as well as alkaline conditions. It is very waterlogging tolerant. It has been widely used as an ideal pioneer plant, although is very productive in its own right. Like red clover, Alsike is an upright plant and can be used for making quality hay. It has been reported to produce photosensitivity in sunny conditions and may cause bloat. Over time it may not persist as fertility increases and more vigorous varieties start to dominate the pasture.

PASTURE LEGUMES

Subterranean clover

Trifolium subterraneum spp.

**6 - 10 kg/ha
(in a mix)**

Sub-clovers are amongst the most widely used pasture legumes in southern Australia. They are typically used in low-medium, winter rainfall dominant areas for extensive grazing operations. The term sub-clover refers to a group of three species:

ssp subterraneum: Black seeded, acidic (3.8) – neutral soils, most soil textures, low-medium rainfall

ssp yanninicum: White seeded, acidic – neutral pH, medium-heavy soils, medium rainfall

ssp brachycalycinum: Mildly acidic (4.5) – alkaline soils, medium-heavy soils, medium rainfall.

The features mentioned above will vary between varieties. Sub-clovers can contain varying levels of phytoestrogens that may affect fertility in sheep, although more recent varieties generally have lower levels. Sub-clover can cause bloat.

They are usually quite susceptible to RLEM; monitoring and control is needed for best performance.

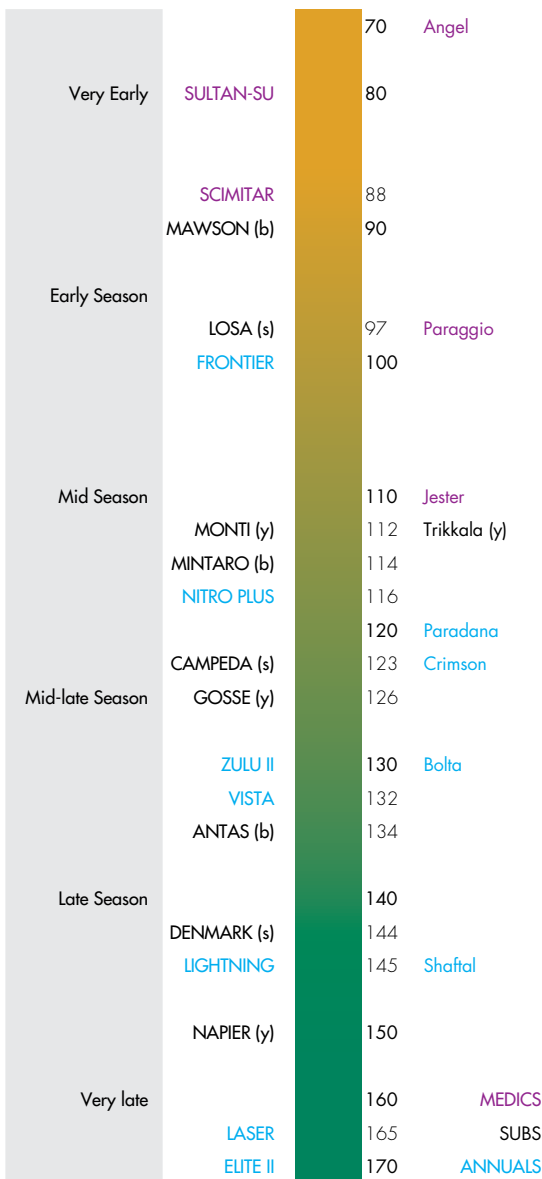
Seeds are relatively large and sowing rates need to be 2 or 3 times higher than most other clovers in order to reach a similar plant density. Sub-clovers are annuals and re-seeding is needed to provide persistent nitrogen fixation and quality in the pasture. Once a pasture has been established with sub-clover, a couple of years of re-seeding will help create a seed bank to back-up the occasional failed season.

Sub-clovers have been developed for varying rainfall and flowering dates. It is highly recommended to sow at least two varieties with differing flowering dates, so as to allow for a spread of flowering and seed-set as frosts, drought, grazing, pests and herbicides may reduce seed-set or cause failure. In areas with an early spring, it is suggested to sow an early and a mid-flowering type. In later areas, sow a mid-maturing and a late variety. Levels of hard-seed will vary between cultivars, although most varieties have at least some hard seed component.

Sub-clover is a high quality protein feed. Sometimes older stock or those not used to an enriched diet will need greater management. In mixed swards, graze pasture according to grass stage e.g. introduce stock at 3-leaf stage of ryegrass or 5-leaf stage of phalaris. Sub-clover will survive as long as there is an accompanied "spelling" phase. Opening up the sward will allow sunlight for the clover to grow and compete.

PASTURE LEGUMES

Sub and Annual Clover Maturity Dates



PASTURE LEGUMES

LOSA

SUBTERRANEUM CLOVER

Black Seeded



C or AgriCote



350+ mm



4.5 - 7.0



Wide Range

- Early season maturity – 97 days to flowering (Perth)
- More productive replacement for Dalkeith and Daliak
- Much improved early vigour
- High hard seeds (30%) for good regeneration and persistence
- Very leafy variety forming a dense and erect stand
- Suited to lower rainfall areas and cropping rotations.

CAMPEDA

SUBTERRANEUM CLOVER

Black Seeded



C or AgriCote



475+ mm



4.5 - 7.0



Wide Range

- Mid season maturity – 123 days to flowering (Perth)
- Greater winter vigour and growth than Woogenellup
- Higher total herbage production and disease tolerance
- Much higher level of hard seeds (29%)
- Increased disease resistance
- High total seed yield and excellent regeneration
- Replacement for Goulburn and Woogenellup
- Alternative for Seaton Park.

DENMARK

SUBTERRANEUM CLOVER

Black Seeded



C or AgriCote



550+ mm



4.5 - 7.0

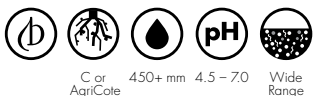


Wide Range

- Late season maturity – 144 days to flowering (Perth)
- Replacement for Karridale and Mount Barker
- Greater full season dry matter production
- Resistance to clover scorch and root rot
- One of the few subs that can continue to grow after flowering
- Highly productive high rainfall/irrigation option.

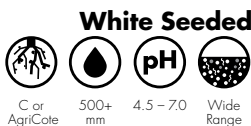
PASTURE LEGUMES

MONTI YANNINICUM CLOVER



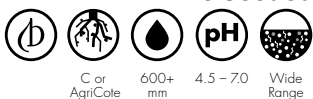
- Flowers earlier than Trikkala and Gosse
- Produces excellent early winter growth
- Excellent adaptation to the shorter growing seasons experienced over the last decade
- Produces excellent seed yields and regenerates reliably
- Has better tolerance to phytophthora root rot and clover scorch than Trikkala
- Well suited to areas receiving an annual rainfall of more than 450mm and prone to waterlogging.

GOSSE YANNINICUM CLOVER



- Mid season maturity – 126 days to flowering (Perth)
- More productive replacement for Trikkala
- Much greater seedling vigour than Trikkala
- Improved growth in both winter and spring
- Higher level of hard seed (25%) more than Trikkala
- Improved resistance to clover scorch and root rot
- Excellence forage for grazing, hay or silage.

NAPIER YANNINICUM CLOVER



- Late season maturity – approximately 150 days to flowering
- Latest maturity yanninicum sub-clover available
- Much greater seedling vigour than Larisa
- Improved growth in both winter and spring
- Higher level of hard seed (37%)
- Good resistance to clover scorch and phytophthora root rot
- Excellence tolerance to wet conditions
- Suited to sites with growing seasons in excess of 8 months.

PASTURE LEGUMES

MAWSON

BRACHYCALYGINUM
CLOVER



C or
AgriCote

400+
mm

4.5 – 8.0

Wide
Range

White Seeded

- Early, 88 days to flower sub-clover bred in Australia by SARDI
- Suitable for a long-term permanent pasture in shorter growing season environments
- Excellent long-term persistence
- Suited to both alkaline and mildly acidic soil types
- Higher levels of hard seed (43%)
- Improved seed yield over similar maturity varieties
- Excellent seed burial (65%).

MINTARO

BRACHYCALYGINUM
CLOVER



C or
AgriCote

400+
mm

4.5 – 8.0

Wide
Range

White Seeded

- Mid season maturity – 114 days to flowering (SA)
- Setting a new standard in mid maturity sub-clover
- Extremely vigorous establishment and winter growth
- High hard seed (45%) and very good regeneration
- Large leaved, upright very productive variety
- Particularly well suited to mildly acidic to alkaline soils.

ANTAS

BRACHYCALYGINUM
CLOVER



C or
AgriCote

400+
mm

4.5 – 8.0

Wide
Range

Black Seeded

- Mid - late season maturity – 134 days to flowering (Perth)
- Exceptionally vigorous establishment
- Amazing winter growth and total production
- Most productive sub-clover available
- Higher level of hard seed offering better persistence
- Widely adapted – mildly acid to alkaline soils
- Has very large leaves offering good grazing and hay production.

Annual Clovers

Annual clover offers a range of grazing, hay and silage options with multiple benefits including nitrogen fixation, weed control rotations and disease breaks. The addition of annual clovers to grass or hay mixes can increase feed quality, protein of feed and provide nitrogen for grass or cereal to grow.

Paddock and Grazing Management

Annual clovers are suited to rotational grazing. When used in a mixed sward, graze to manage grass but ensure animals do not re-graze areas, as this will greatly affect the recovery of annual clover. In pure stands, avoid grazing in the middle of winter. Don't graze below 5-8cm to allow maximum recovery. Avoid pugging.

In general, growth period between grazing will be around 50-60 days in winter and 30-40 days in spring. These clovers are generally annual options only, however hard seeded varieties (e.g. Balansa) can be locked up just prior to flower initiation. They will then flower and set seed, and providing there is initial dry matter, graze hard prior to the autumn break to allow maximum germination.

Monitor stock – especially relating to issues such as bloat and excess protein. Certain weather conditions, lack of fibre and other energy sources can cause some stock issues. Remove stock during such times. Allow access to good quality water.

Balansa clover **2 - 5 kg/ha (in a mix)**

Trifolium michelianum

Annual legume for medium rainfall areas that suits most soils of acid - neutral pH. Tolerates mild salinity and some waterlogging. Suitable for grazing and fodder conservation with fair winter growth. It is very early flowering and seed-set can be affected by frosts. Often used as part of a HDL mix as the earliest flowering component. Also useful as an alternative to sub-clover in perennial pastures, or to add bulk and quality to annual and Italian ryegrass hay crops. Regenerates by re-seeding. Hard-seeded.

PASTURE LEGUMES

FRONTIER BALANSA CLOVER



C or AgriCote

300+ mm

4.5 – 8.0

Wide Range

Early Maturing

- Early maturing approximately 100 days to flowering
- Tolerates waterlogging and mild soil salinity
- Tolerates a wide range of broadleaf herbicides
- High winter/spring dry matter production and nitrogen fixation
- Excellent regeneration from hard seed
- Recovers strongly from heavy grazing.

VISTA BALANSA CLOVER



C or AgriCote

450+ mm

4.5 – 8.0

Wide Range

Late Maturing

- Late season maturity – approximately 130 days
- Superior spring/early summer growth
- Tolerates waterlogging and mild soil salinity
- Highly tolerant to clover scorch
- Well suited for annual/short term ryegrass mixes
- High quality hay or standing feed
- High hard seed levels aid regeneration
- Replaces and supersedes Bolta and Paradana.



PASTURE LEGUMES

Persian clover 2 - 5 kg/ha (in a mix)

Trifolium respunitum spp. *majus*,
T. resupinatum spp. *resupinatum*

Annual legume for medium rainfall areas that suits most soils of neutral - moderately alkaline pH. Tolerates mild salinity and some waterlogging. Suitable for grazing and fodder conservation with fair-good winter growth. It is later flowering than balansa and an essential component in HDL mixes. Also useful as an alternative to sub-clover in perennial pastures, or to add bulk and quality to annual and Italian ryegrass hay crops. Regenerates by re-seeding. Hard-seeded (ssp. *resupinatum*) and soft-seeded varieties (ssp. *majus*) available.

Soft Seeded

LASER

PERSIAN CLOVER



C or AgriCote 550+ mm 5.5 - 8.5 Wide Range

- Late season Persian – approximately 165 days to flowering
- Well suited to irrigation and summer rainfall
- Suitable for multiple grazing and hay cuts
- Used for fodder cropping and HDL mixes
- Improved rust resistance compared to Maral/Shaftal
- Superior quality to Maral/Shaftal
- Suitable for mixes with short term ryegrass
- Typically 20-30% more yield than Shaftal.

Soft Seeded

LIGHTNING

PERSIAN CLOVER



C or AgriCote 450+ mm 5.5 - 8.0 Wide Range

- Mid season maturity – about 145 days to flowering
- Vigorous, erect to semi-erect annual clover
- Establishes quickly from a later sowing
- Tolerates waterlogging and mild soil salinity
- Forage/fodder cropping/HDLs or annual mixes
- Can be sown with oats or short-term ryegrass.

PASTURE LEGUMES

Hard Seeded

NITRO PLUS

PERSIAN CLOVER



C or
AgriCote

325+ mm

5.5 – 8.5

Wide
Range

- Prostrate to semi-prostrate self-regenerating annual clover
- Early-mid season maturity – as early as 68 days to flowering
- Average 114 days to flowering
- High hard seed level – excellent regeneration
- Tolerates waterlogging and mild soil salinity
- Resistant to clover scorch and phytophthora root rot
- Suitable for haymaking and grazing
- Excellent cereal rotation legume
- Supersedes Kyambro.

Berseem clover

2 - 5 kg/ha (in a mix)

Trifolium alexandrinum

Annual legume for medium-high rainfall areas that suits medium-heavy soils of neutral - moderately alkaline pH. Suitable for grazing and fodder conservation with reasonable winter growth. Can be affected by frosts. Often used as part of a HDL mix and can produce multiple hay cuts. Regenerates by re-seeding. Soft-seeded.



PASTURE LEGUMES

Arrowleaf clover 2 - 5 kg/ha (in a mix)

Trifolium vesiculosum

Annual legume for medium rainfall areas that suits well-drained soils of acid - neutral pH and tolerates mild salinity. Suitable for grazing and fodder conservation with fair winter growth. It is very late flowering and seed set can be affected by drought. Often used as part of a HDL mix as the latest flowering component. It is also useful as an alternative to sub-clover in perennial pastures, or to add bulk and quality to annual and Italian ryegrass hay crops. Not known to cause bloat. Regenerates by re-seeding. Hard-seeded.

Very Hard Seeded

CEFALU

ARROWLEAF CLOVER



C or AgriCote

400+ mm

4.5 - 7.5

Well drained

- Early maturity – approximately 110 days to flowering
- Excellent tolerance to acid soils
- Deep taproot can reach perched water tables increasing growth in drier seasons
- Early maturity – 20 days earlier than Zulu II
- Not known to cause bloat
- Excellent regeneration from hard seed
- Suited to green manuring
- Upright growth habit making it well suited to grazing or hay.

Very Hard Seeded

ZULU II

ARROWLEAF CLOVER



C or AgriCote

400+ mm

4.5 - 7.5

Well Drained

- Approximately 130 days to flowering
- Excellent tolerance to acid soils
- Excellent spring and early summer growth
- Well adapted to loamy and deep acidic sandy soils
- Deep taproot which can increase growth in drier seasons
- High level of hard seed ensures good regeneration
- Not known to cause bloat.

PASTURE LEGUMES

Crimson clover **2 - 5 kg/ha (in a mix)**

Trifolium incarnatum

Low pH tolerant annual for medium rainfall areas with well drained soils. Suitable for grazing and fodder conservation with reasonable winter growth. Traditionally used as a pioneer plant on acid soils of limited fertility. Regenerates by re-seeding. Soft-seeded.

Rose clover **2 - 5 kg/ha (in a mix)**

Trifolium hirtum

Early flowering annual legume that suits hard-setting acidic soils in low rainfall areas. Often used as a pioneer plant where early flowering and seed set is useful. It is not very productive or persistent over the longer period, but can do a job where sub-clovers and many medics struggle. Regenerates by re-seeding. Hard-seeded.

Gland clover **1 - 3 kg/ha (in a mix)**

Trifolium glanduliferum

Low pH tolerant annual for low rainfall areas in extensive grazing operations. Regenerates by re-seeding. Typically very hard-seeded.

Bladder clover **2 - 4 kg/ha (in a mix)**

Trifolium spumosum

Upright annual legume for low-medium rainfall areas with soils of mildly acidic – mildly alkaline pH. Suits well drained soils and is intolerant of waterlogging or salinity. Requires careful management during flowering to allow sufficient seed-set for regeneration. May contribute to bloat in certain conditions. Regenerates by re-seeding. Hard seeded.



PASTURE LEGUMES

Medics

In southern Australia's semi-arid agricultural zones, annual medics (*Medicago* spp.) may often be useful to provide feed for livestock. They also improve soil fertility through nitrogen fixation and act as a disease break for various cereal root pathogens. These self-regenerating pasture species have relatively high levels of hard seeds. This enables them to persist through cropping phases and regenerate in subsequent years as pasture. In an exciting recent development, Heritage Seeds has released varieties that have tolerance to residual Group B (sulfonyl-urea) herbicides, which are commonly used in areas normally suited to medics.

Barrel medic

2 - 4 kg/ha (in a mix)

Medicago truncatula

Annual forage legume that suits neutral to alkaline pH range. Suits low-moderate rainfall extensive grazing areas. Good for cereal/pasture rotations. Regenerates by re-seeding. Typically very hard-seeded.

SULTAN-SU

SU TOLERANT BARREL MEDIC

- First barrel medic with tolerance to SU herbicide residues
- Early maturing (~ 70-90 days to flowering), similar to Caliph and Angel
- Caliph hybrid with improved regeneration
- Less hard seeded than Caliph (~ 85% cf 95%), similar to Jester
- Good aphid resistance (BGA and SAA)
- Boron tolerant.

Mid Maturing



AM or AgriCote

275 - 450+ mm



5.5 - 8.5



Loam-Clay



PASTURE LEGUMES

Burr medic

2 - 4 kg/ha (in a mix)

Medicago polymorpha

Annual forage legume that suits heavier soils of neutral to alkaline pH range. Suits low-very low rainfall extensive grazing/cropping areas. Good for cereal/pasture rotations that have longer pasture phase. Can tolerate some waterlogging. Regenerates by reseeding. Higher level of soft seeds than strand or barrel medics.

Early-Mid Maturing

SCIMITAR

SPINELESS BURR MEDIC



AM or AgriCote 350+ mm 5.3 - 8.5 Wide Range

- Early to mid season – approximately 90 days to flowering
- Erect growth habit with high herbage and seed production
- Maturity is seven days later than Santiago
- Adaptable variety which grows on wide range of soils
- High percentage of soft seed (24%) – Santiago (8.5%)
- Excellent ley farming option with denser regeneration
- Increased salinity tolerance over other medics
- Better waterlogging tolerance.

Other Medics

Strand medic

2 - 4 kg/ha (in a mix)

Medicago littoralis

Annual forage legume that suits sandy/loamy soils in the neutral to alkaline pH range. Suits low-very low rainfall extensive grazing areas. Good for cereal/pasture rotations. Regenerates by re-seeding. Typically very hard-seeded.

Snail medic

2 - 4 kg/ha (in a mix)

Medicago scutella

Annual forage legume that suits heavier soils with a neutral to alkaline pH range. Suits low-moderate rainfall extensive grazing/ cropping areas. Good for cereal/pasture rotations. Regenerates by re-seeding, soil disturbance often needed to obtain a good strike. Large seed pods are easily grazed by sheep.

PASTURE LEGUMES

Disc medic

2 - 4 kg/ha (in a mix)

Medicago tornata

Annual forage legume that suits sandy/loamy soils in the neutral to alkaline pH range. Suits low-medium rainfall extensive grazing/cropping areas. Good for cereal/pasture rotations. Regenerates by re-seeding. Typically very hard-seeded.

Sphere medic

2 - 4 kg/ha (in a mix)

Medicago sphaerocarpus

Annual forage legume that suits acidic medium to heavy soil, but intolerant of waterlogging. Will grow in a wide pH range from about 5 to 8. Suits low - very low rainfall extensive grazing/cropping areas with unreliable rainfall and varying soil types. Regenerates by re-seeding.

Gama medic

2 - 4 kg/ha (in a mix)

Medicago rugosa

Annual forage legume that suits heavier alkaline soils. Suits low-very low rainfall extensive grazing/cropping areas with unreliable rainfall and varying soil types. Upright growth habit is useful for an early hay crop. Regenerates by re-seeding.



PASTURE LEGUMES

Other Pasture Legumes

Sulla

8 - 12 kg/ha

Hedysarum coronarium

High-yield, short-lived (2-3 year) perennial crop for grazing, fodder and honey production. It contains condensed tannins which negate the threat of bloat. Sulla suits areas with relatively mild winters, although will tolerate some light frosts. Plant survival into later years will be greater in areas with cooler milder summers, such as southern mainland Australia, coastal areas and Tasmania. Soils need to be free draining, with reasonable-good fertility and a pH greater than 5.8 (CaCl₂).

Lotus (Greater lotus/Big trefoil)

**1 - 3 kg/ha
(in a mix)**

Lotus pedunculatus

Lower pH tolerant, deep rooted perennial legume for low rainfall areas. Will also suit marshy ground and re-claimed swamp areas. Tolerant of red legged earth mites. Non-bloating and highly palatable except when in flower.

Lotus (Birdsfoot trefoil)

2 - 5 kg/ha (in a mix)

Lotus corniculatus

Summer active, perennial pasture legume that suits medium rainfall, frost-free areas unsuitable for lucerne. Will grow well in acidic soils and low phosphorus levels, although will respond to improved fertility. Not as tolerant to waterlogging as greater lotus. Often used in sandy coastal areas or wet hilly country as a pioneer plant. Slow to establish, does not tolerate continuous heavy grazing or hot summers. Non-bloating. Good companion for phalaris or tall fescue. Regenerates only from seed. Best sown in spring to avoid frost during establishment.

PASTURE LEGUMES

Serradella

3 - 6 kg/ha (in a mix)

Ornithopus spp.

Acid, aluminium tolerant annual legume that suits well drained sandy soils. Suitable for grazing and hay production in low rainfall areas. Non-bloating. Tolerates red legged earth mites. Regenerates by reseedling, seed hardness depends on species:

French (pink) Serradella:

High levels of soft seeds, prostrate growth habit

Yellow Serradella:

Mostly hard-seeded, more upright growth, most persistent

Hybrids:

Intermediate level of hard seeds, intermediate growth habit.

Biserrula

4 - 6 kg/ha (in a mix)

Biserrula pelecinus

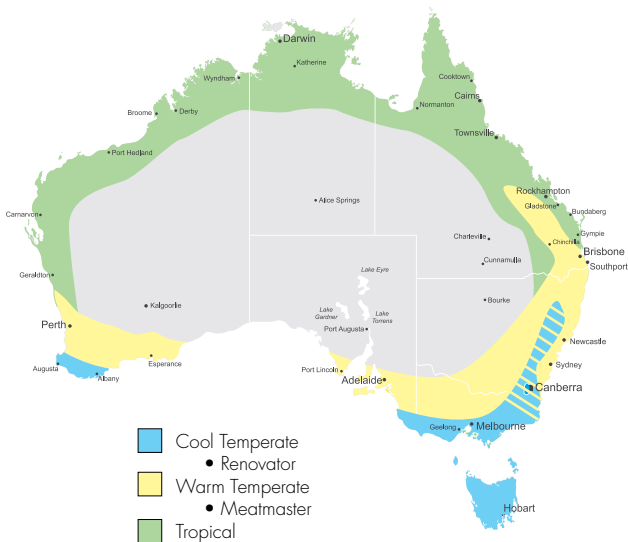
Low pH tolerant, deep rooted annual legume for low rainfall areas. Tolerant of red legged earth mites. Needs to regenerate from re-seeding each year. Varying levels of hard-seed depending on the variety.



PASTURE BLENDS AND MIXES

Premium Pasture Blends

The Renovator and Meatmaster temperate range of pasture blends provide farmers with the right mix necessary to produce superior results and superior pastures. They are premium seed blends formulated using Heritage Seeds' strong agronomic, technical and research advantage. The blends are designed using only the highest quality seed and are 'ready to sow' providing livestock farmers with the best possible pasture outcomes.



Tropical Meatmaster blends are described on pp 120-123.

Key to following pages:

- D** Dairy
- B** Beef production
- L** Lamb production
- W** Wool and general sheep production
- E** Equine – horses, ponies etc
- F** Fodder production – silage and hay
- C** Cropping break option
- I** Irrigation very suitable

PASTURE BLENDS AND MIXES

Renovator Guide

For cool-temperate southern Australia

	PURPOSE	STOCK / USE PATTERN	PREMIUM PASTURE BLEND	PG
Perennial Pasture	High performance	Dairy, beef	Renovator HR	68
	Performance, tougher sites	Dairy, beef, lamb	Renovator 850i	68
	Performance, summer dry	Dryland dairy, beef, lamb	Renovator 700	69
	Marginal ryegrass country	Beef, sheep	Renovator Grazier	70
	Extensive, summer moisture	Beef, sheep, equine	Renovator 500+	71
	Extensive, summer dry	Beef, sheep, equine	Renovator GT	72
	Easy care horse pasture	Equine	Renovator Equine	70
Oversowing	2-5 year pasture extension	Dairy, beef, lamb	Renovator Elite	69
Short-term options	Winter feed, early summer grazing	Grazing, silage, hay	Renovator SR	72
	Spring silage	High yield specialty silage	Spring Silage Blend	73

PASTURE BLENDS AND MIXES

DBLFI | Very Late Maturing

RENOVATOR HR

PREMIUM PASTURE BLENDS



AgriCote 700+ mm 4.8 – 8.0 Wide Range

High performance dairy and finishing

Renovator HR is a high performance and palatable blend for high rainfall and irrigated application. Bealey and Impact 2 are two late flowering perennial ryegrasses for improved animal production and freedom from staggers. Storm and Weka white clovers provide excellent grazing tolerance and persistence with year round production, with the advantage of AgriCote.

VARIETY	SPECIES	%
Bealey	Perennial ryegrass	50
Impact 2	Perennial ryegrass	35
Storm	White clover	7.5
Weka	White clover	7.5

Sowing rate: 25-30 kg/ha

DBLFI | Late Maturing

RENOVATOR 850i

PREMIUM PASTURE BLENDS



AgriCote 650+ mm



4.8 – 8.0 Wide Range

Performance dairy and finishing, harder going

The Renovator 850i formulation produces a highly productive permanent pasture for high rainfall or irrigated applications. Arrow and Impact 2 are densely tillered, higher performance diploid perennial ryegrasses. Both aid recovery from potential pugging and improve persistence under more challenging conditions. AgriCote Storm and Weka white clovers combine to provide year round production and excellent grazing and heat tolerance.

VARIETY	SPECIES	%
Arrow	Perennial ryegrass	40
Impact 2	Perennial ryegrass	40
Storm	White clover	10
Weka	White clover	10

Sowing rate: 25 kg/ha

PASTURE BLENDS AND MIXES

DBLFI | Very Late Maturing

RENOVATOR ELITE

PREMIUM PASTURE BLENDS



700+
mm



4.8 – 8.0



Wide
Range

Dairy and finishing, oversowing

Renovator Elite is ideal for providing a 3-4 year high-performance pasture. Excellent cool-season growth and very late finishing. Good capacity for irrigation response over summer over-sowing run-down or clover dominant pastures, or for pure ryegrass swards. This combination provides even growth, easy spring management and all round performance from Bealey tetraploid perennial ryegrass and extra yield potential from Shogun tetraploid hybrid. NEA endophyte to assist with persistence. Ideal for over-sowing into existing tetraploid pastures.

VARIETY	SPECIES	%
Bealey	Perennial ryegrass	50
Shogun	Hybrid ryegrass	50

Sowing rate: 25-35 kg/ha (Pure Stand), 20 kg/ha (Oversowing)

DBLWFI | Mid-Late Maturing

RENOVATOR 700+

PREMIUM PASTURE BLENDS



AgriCote



650+ mm



4.8 – 8.0



Wide
Range

Performance in dryland dairy/finishing

Renovator 700+ is a highly productive permanent pasture blend for higher rainfall dryland applications, and also very much suited to elevated, winter-cold areas. The inclusion of the all-round performance of Impact 2, and the hardy spreading nature of Rohan combines to offer a resilient, high quality pasture. Storm white clover has excellent cool-season growth, high yield and excellent feed quality. Monti and Denmark sub-clovers will increase pasture persistence through good seed-setting and performance under dry conditions.

VARIETY	SPECIES	%
Impact 2	Perennial ryegrass	32.5
Rohan SPR	Perennial ryegrass	32.5
Storm	White clover	10
Monti	Sub-clover	12.5
Denmark	Sub-clover	12.5

Sowing rate: 25 kg/ha

PASTURE BLENDS AND MIXES

BLWEF | Winter Active

RENOVATOR GRAZIER

PREMIUM PASTURE BLENDS



AgriCote 500+ mm



4.5 - 8.0



Wide
Range

Early season ryegrass blend

Renovator Grazier is a productive high quality grass and clover pasture for moderately medium - high rainfall areas where late season rain is unreliable. AgriCote sub-clovers ensure good legume growth and improved energy with Kidman and Barberia providing excellent bulk growth that will not cause staggers.

VARIETY	SPECIES	%
Kidman	Perennial ryegrass	30
Barberia	Long rotation ryegrass	30
Howlong	Cocksfoot	10
Monti	Sub-clover	15
Campeda	Sub-clover	15

Sowing rate: 25 kg/ha

BLWEF | All Year Growth

RENOVATOR EQUINE

PREMIUM PASTURE BLENDS



AgriCote 500+ mm



4.5 - 8.0



Wide
Range

Low maintenance horse blend

This is a fast establishing, productive, hardy and reliable blend suitable for all classes of horses. Arrow AR1 will provide excellent grazing quality as well as the bulk of a spring flush for hay making if required. Barberia ryegrass is highly winter active giving the pasture blend year-round growth.

VARIETY	SPECIES	%
Summer active tall fescue	Summer active tall fescue	30
Arrow	Perennial ryegrass	30
Barberia	Long rotation ryegrass	40

Sowing rate: 25-50 kg/ha

PASTURE BLENDS AND MIXES

BLWEFI | Summer Active

RENOVATOR 500+

PREMIUM PASTURE BLENDS



AgriCote 500+ mm



4.8 - 8.0

Wide Range

Hardiness, performance, summer moisture
Renovator 500+ is a productive high quality permanent pasture suited to heavier soil types with good water holding capacity. Renovator 500+ gives an optimum mix of seasonal production and persistence, and will particularly suit heavier soil types and areas that can capture some summer moisture. Ideal for year round set-stocking or rotational grazing and hay production. AgriCote SARDI 7 Series 2 can be included to assist spring, summer and autumn growth.

VARIETY	SPECIES	%
Summer active tall fescue	Summer active tall fescue	32.5
Barberia	Long rotation ryegrass	20
Howlong	Cocksfoot	10
Lawson	Phalaris	10
Denmark	Sub-clover	10
Antas	Sub-clover	10
Palestine	Strawberry clover	7.5

Sowing rate: 18-20 kg/ha



PASTURE BLENDS AND MIXES

BLWEF | Summer Dormant

RENOVATOR GT

PREMIUM PASTURE BLENDS



AgriCote 450+ mm 4.5 - 8.0 Wide Range

Hardiness, performance, summer dry

Renovator GT has been developed as a long-term, productive and persistent pasture for extensive cattle and sheep enterprises. It has the resilience of the most highly grazing tolerant phalaris, a hardy cocksfoot, with the cool season productivity of an early heading perennial ryegrass. The clovers are highly productive as well as being prolific re-seeders. Renovator GT will suit a wide range of soil types, modest as well as higher rainfall areas, will cope with dry years and continue to be productive in the longer term.

VARIETY	SPECIES	%
Kidman	Perennial ryegrass	35
Holdfast GT	Phalaris	20
Mintaro	Sub-clover	15
Campeda	Sub-clover	15
Storm	White clover	7.5
Howlong	Cocksfoot	7.5

Sowing rate: 15-18 kg/ha

DBLFCI | Short Term

RENOVATOR SR

PREMIUM PASTURE BLENDS



AgriCote 500+ 4.5 - 8.0 Wide Range

Quality grazing and fodder 1-2 years

Renovator SR offers the combination of Hogan for fast establishment and high winter growth and combines Hulk Italian ryegrass for longer lasting feed into the late spring-early summer. AgriCote annual clovers improve the quality of pasture for grazing, silage or hay production.

VARIETY	SPECIES	%
Hulk	Italian ryegrass	30
Hogan	Annual ryegrass	50
Laser	Persian clover	20

Sowing rate: 25-30 kg/ha

PASTURE BLENDS AND MIXES

DBLFCI | Yield and Quality

RENOVATOR SPRING SILAGE BLEND

PREMIUM PASTURE BLENDS



E or AgriCote



500+ mm



4.5 – 8.0



Wide Range

High yield silage crop (pea and oat mix)

Spring Silage Blend offers an excellent later planting option for good silage production in southern areas. Usually sown from June to September in higher rainfall areas with a typically longer spring season. High yield of good quality feed may be produced from a modest area over a relatively short period. Mammoth oats provide yield, energy and reliable bulk. Field peas add protein and improve digestibility and overall animal performance. Silage inoculation is usually advisable at harvest time. Harvest when the pea is at flat pod or the oats milky-dough, whichever is first.

VARIETY	SPECIES	%
Mammoth	Forage oats	40
Morgan	Field pea	60

Sowing rate: 120-180 kg/ha

CUSTOM BLENDS

The range of Renovator and Meatmaster blends contain excellent options for many applications. Particular circumstances and preferences will often dictate that specific mixes may be needed for certain situations. Heritage Seeds has a number of seed mixing locations and would be pleased to accommodate specific requirements.

Please get in touch with your territory manager to discuss your individual needs and we'd be pleased formulate a custom blend.

PASTURE BLENDS AND MIXES

Meatmaster Guide

For warm-temperate inland and coastal Australia

	PURPOSE	STOCK / USE PATTERN	PREMIUM PASTURE BLEND	PG
Longer-term Pasture	High performance	Dairy, beef, lamb	Meatmaster B-Double Mix	74
	Specialty finishing	Beef, lamb	Meatmaster LC	75
	Performance, summer moisture	Beef, sheep	Meatmaster HP	75
	Extensive, summer moisture	Beef, sheep, equine	Meatmaster 500	76
	Extensive, summer dry	Beef, sheep, equine	Meatmaster GT	76
	Extensive, acid/aluminium soils	Beef, sheep, equine	Meatmaster AT	77
Short-term options	Winter feed focus	Grazing, silage, hay	Meatmaster ST	77

MEATMASTER B-DOUBLE MIX

PREMIUM PASTURE BLENDS

DBLFCI | Short Term



650+ mm 4.8 – 8.0 Wide Range

High yield grazing and fodder 2-4 years

The B-Double Mix is an ideal combination of high performance, highly palatable ryegrasses designed to provide year round, quality feed for maximum production. The mix combines the strong late spring and summer growth of Bealey with Barberia's explosive late autumn, winter and early spring feed.

VARIETY	SPECIES	%
Bealey	Perennial ryegrass	60
Barberia	Long rotation hybrid ryegrass	40

Sowing rate: 15-25 kg/ha

PASTURE BLENDS AND MIXES

DBLFI | Finishing Blend

MEATMASTER LC

PREMIUM PASTURE BLENDS



AgriCote 650+ mm



4.8 - 8.0 Wide Range

Finishing blend 3-4 years plus

A highly palatable and nutritious pasture for use in high rainfall or irrigated, intensive systems with an emphasis on finishing numbers of prime stock. The lucerne and chicory produce quality feed from spring to autumn with improved animal performance when summer grasses are below optimal quality.

VARIETY	SPECIES	%
Commander	Chicory	25
SARDI 7 Series 2	Lucerne	75

Sowing rate: Marginal/dryland 6-10 kg/ha
Irrigation/high rainfall 15-20 kg/ha

DBLFCI | Long-Term Pasture

MEATMASTER HP

PREMIUM PASTURE BLENDS



AgriCote 600+ mm



4.8 - 8.0 Wide Range

Summer rainfall

A productive year round pasture for the 600 to 800mm rainfall or summer temperate tablelands environments. This mix provides production and persistence in high performance grazing systems.

VARIETY	SPECIES	%
Summer active tall fescue	Summer active tall fescue	75
Storm	White clover	10
Tuscan	Red clover	15

Sowing rate: 20-25 kg/ha

PASTURE BLENDS AND MIXES

DBLWEFCI | Long-Term Pasture

MEATMASTER 500

PREMIUM PASTURE BLENDS



AgriCote 500+ mm



5.0 - 8.0 Wide Range

Hardy blend late areas

A long term pasture for use in 500 to 650mm winter dominant rainfall zones with later spring rainfall. Provides high spring/summer production with solid winter growth from Prosper, Holdfast GT and a productive sub-clover mix.

VARIETY	SPECIES	%
Summer active tall fescue	Summer active tall fescue	30
Prosper	Winter active tall fescue	20
Holdfast GT	Phalaris	20
Mintaro	Sub-clover	10
Campeda	Sub-clover	10
SARDI-Grazer	Lucerne	10

Sowing rate: 18-20 kg/ha

BLWEF | Long-Term Pasture

MEATMASTER GT

PREMIUM PASTURE BLENDS



AgriCote 400+ mm



5.0 - 8.0 Wide Range

Hardy beef and sheep blend

Designed as a general purpose, extensive beef and sheep mix. Holdfast GT is a highly winter active and set-stock tolerant phalaris with reduced toxicity issues. Mintaro and Campeda sub-clovers offer productivity and resilience through good regeneration and excellent ability to self-inoculate (from back-ground rhizobia) in subsequent years.

VARIETY	SPECIES	%
Holdfast GT	Phalaris	45
Mintaro	Sub-clover	27.5
Campeda	Sub-clover	27.5

Sowing rate: 8-15 kg/ha

PASTURE BLENDS AND MIXES

BLWEF | Long-Term Pasture

MEATMASTER AT

PREMIUM PASTURE BLENDS



AgriCote 400+ mm



5.0 - 8.0 Wide Range

Hardy beef and sheep blend

Developed for extensive areas with a typically low pH, or high levels of aluminium at depth. Where other grasses struggle in wet, acid conditions, Advanced AT can offer a very productive option. Howlong cocksfoot is included to colonise drier spots in an undulating landscape. Campeda and Monti sub-clovers have good tolerance to water-logging, acidic soils and are prolific re-seeders.

VARIETY	SPECIES	%
Advanced AT	Phalaris	30
Howlong	Cocksfoot	10
Campeda	Sub-clover	30
Monti	Sub-clover	30

Sowing rate: 8-15 kg/ha

DBLWFCI | Short-Term Pasture

MEATMASTER ST

PREMIUM PASTURE BLENDS



AgriCote 500+ mm



4.8 - 8.0 Wide Range

High yield grazing and fodder 1 year

A fast establishing, highly productive annual mix ideal for high quality winter grazing and spring hay or silage. Suited to irrigation or 550mm+ winter dominant rainfall broad acre systems.

VARIETY	SPECIES	%
Vortex	Annual ryegrass	80
Laser	Persian clover	10
Vista	Balansa clover	10

Sowing rate: 12-15 kg/ha

LUCERNE

Specialty Forages

This group of species is often used for more specific outcomes: to fill a feed gap, fodder production, a stepping stone in a renovation program or as a break crop. They have terrific yield potential and good gains may be made through their inclusion in a forage production program.



Lucerne

Medicago sativa

In Australia, lucerne is used as a long term pasture for grazing and/or hay production, a short term stand in cropping rotations, or as the legume component of mixed pastures. Being a legume, lucerne has the ability to fix atmospheric nitrogen, providing nitrogen for its own growth, to companion species or increasing soil nitrogen levels for subsequent crops.

Lucerne can utilise more rainfall and dry the soil profile with a large taproot that can easily grow to three metres depth or more to access deep soil moisture. This taproot also acts as an energy store for the plant making established lucerne very hardy.

Lucerne has a moderate tolerance of salinity, which combined with its ability to dry the soil profile and lower the water table makes it a useful tool in managing soil salinity, particularly as an option in recharge areas.

The main limitations to lucerne's use in Australia are soil waterlogging and high soil aluminum (Al^{3+}) levels which inhibit root development and cause difficulties with establishment.

Modern lucerne varieties are now available that have been developed in Australia under grazing for Australian conditions, with adequate resistance to key pests and diseases verified in Australia, ensuring they have the best chance of performing in our unique environment.

Selection of the right lucerne variety is a crucial component of establishing a successful, productive and profitable lucerne stand.

	400mm rainfall	500mm rainfall	600mm rainfall	700mm rainfall	800mm rainfall	Irrigation
SOWING RATES KG/HA	4-5	5-6	6-7	7-8	8-9	15-20

LUCERNE

Yield Potential and Fertility

Lucerne can produce a wide range of yields potentially ranging up to 10-25 tonnes DM/ha/yr. Phosphorus and potassium (K) maintenance are essential, especially in a cut and carry operation where high levels of K (20-30K/t of DM) leave the paddock. For each 10t DM this equates to 200 kg calcium (Ca), and when compared to 360 kg Ca in one tonne of limestone lime, indicating that on average 1T lime/ha every two 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 150 – 200 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 - 100 g

As a Pasture Mix

When sowing lucerne 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.

Undersowing in Cereals

If undersowing lucerne with a cereal grain crop, cut the cereal rate back to 50% to ensure a good lucerne stand is maintained. Expect lower cereal yields as a consequence.

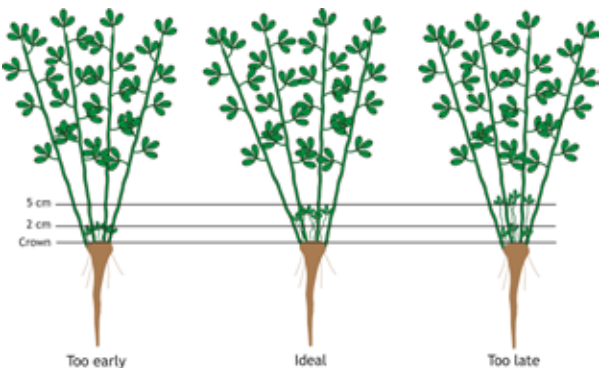
Cutting

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
Winter active	27 - 30
Highly winter active	25

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.



Grazing Management

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, 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 tend to graze 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.

Winter Dormant Lucerne

Winter dormant lucernes grow actively through spring and summer and into early autumn when growth rates decline. They can be very productive under high rainfall or irrigation, but less productive than winter active types in regions with winter dominant rainfall below 650mm.

These varieties generally have a low prostrate crown giving good grazing tolerance and improving persistence. They also have a high leaf to stem ratio which can contribute to higher feed and hay quality. Winter dormant lucernes are not suited to late autumn/early winter sowing.

These lucernes 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 can also be used in mixtures with perennial grasses.

Grazing Tolerant Lucerne

Select lucerne cultivars developed for and selected under grazing in Australia. These have been screened and re-selected under protocols which provide such features as a low and broad crown, high number of auxiliary buds, and have been subjected to very high grazing pressure for extended periods. The Australian program run by SARDI and Heritage Seeds has these features built in as breeding objectives, which result in the high resilience to grazing of all varieties in the range.

SARDI-GRAZER LUCERNE

- The most grazing tolerant commercial lucerne variety in Australia
- Winter active
- 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
- Well suited to mixed swards with perennial grasses such as winter active tall fescue, cocksfoot or phalaris.

Dormancy 6



AL or AgriCote

325+ mm



5.0 - 8.0



Deep Well Drained

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 Anthracnose), 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.

LUCERNE

Winter Active Lucerne

Winter active lucernes have an intermediate crown and can provide excellent grazing tolerance and persistence. They are the most versatile and therefore the most popular lucerne group, giving good growth into late autumn and holding their quality longer than highly winter active varieties.

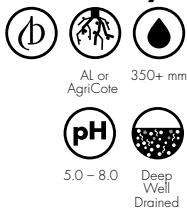
Winter active varieties are best suited to medium term mixed farming situations that require grazing tolerance and the ability to make good quality hay. They are well suited to irrigated or dryland production and are useful as a pure stand or as a perennial legume component in pasture blends for regions with 450-650mm winter dominant rainfall.

These 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

- The most broadly adapted dormancy 7 lucerne available
- Produces many fine, upright stems which carry a high number of large leaves
- Persistent and tolerant of grazing
- Broad pest and disease resistance profile
- Higher total dry matter than more winter dormant varieties
- Suited to continual harvesting, hard grazing and treading
- Replacement for the original SARDI 7.

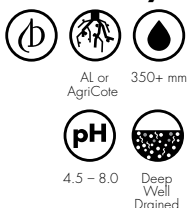
Dormancy 7



SARDI 7 SERIES 2 LUCERNE - ACID TOLERANT

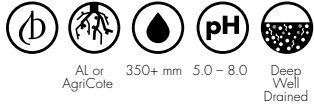
- New developing product
- New rhizobia strain (SRD1736) with improved tolerance to acidic soil with high aluminium content
- No yield penalty in soils with pH of 4.2 CaCl₂ and Al below 10%
- Australian developed in a collaboration between MLA, Heritage Seeds and SARDI
- Evaluated for use with SARDI 7 Series 2
- Broad pest and disease resistance profile.

Dormancy 7



GENESIS II

LUCERNE



- 3-5% improved herbage yield compared to Genesis
- Semi winter active variety resistant to major root diseases
- Well suited to hay and grazing production systems
- Excellent persistence
- Demonstrates good resistance to major aphid groups
- Genesis II is a replacement for the original Genesis.

Highly Winter Active Lucerne

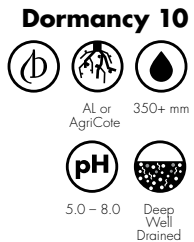
Highly winter active lucernes are bred for late autumn/early winter sowing and have excellent seedling vigour for undersowing. Some of the newer Australian bred material in this group has increased grazing tolerance because it was selected from and developed for these broadacre grazing systems.

These lucernes have a more upright crown and erect growth habit, they are well suited to a 2-4 year cropping rotation system in the 300-500mm rainfall zones. They provide maximum growth from winter dominant growing season rainfall. Generally highly winter active lucernes do not persist as well as more dormant types.

SARDI 10

LUCERNE

SERIES 2



- Multiple screens for excellent disease and insects resistance
- Very good seedling vigour
- Highly productive 3-4 year option
- 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.

FORAGE BRASSICAS AND HERBS

Forage Brassicas

Brassicas are specialty forage crops – potentially high yielding, high quality seasonal crops that are established during the warmer months to fill a summer, autumn or winter feed gap.

Sowing rates vary widely, and depend on many factors including:

- condition of the seed-bed at sowing time, method and accuracy of sowing equipment
- seed size
- length of time to maturity.

Brassicas need a fine, weed-free seed bed, with a pH of 5.5 or above. Crops may respond to boron, molybdenum and phosphorus. Nitrogen application is usually needed, but care should be taken to avoid nitrate poisoning, particularly with drought (or other) stressed crops. Brassica crops will often respond well to appropriate applications of potassium, as this will tend to aid keeping ability and leaf retention. High rates of sulphur are not advised unless the site is particularly low in S. Newly introduced stock should be carefully monitored, and may take a little time to become accustomed to the crop. Flowering crops should not be fed to livestock.

Within the brassica options there are good forage solutions as well as great versatility. As maturity times are relatively predictable, brassicas offer a terrific tool for feed budgeting to meet forage demand and output targets. Seek specific advice for your situation.

FORAGE BRASSICAS AND HERBS

Forage rape

2 - 5 kg/ha

Brassica napus

Rape is a fast maturing leafy, single or multi-graze crop that can be sown for summer, autumn or winter feed. It typically has higher protein and dry matter than turnips. Rape can be sown from early spring to late summer in southern areas, or may be used as valuable winter feed by autumn sowing in many climates.

Usually sown as a lone stand, but may be sown in combination with other summer forages such as millet, or often sown for winter feed in combination with annual or Italian ryegrasses with good results. Rape's feed value is high, but usually the crop must be mature before grazing approximately 10-12 weeks after sowing. Some varieties are suitable for grazing at 8-10 weeks.



FORAGE BRASSICAS AND HERBS

INTERVAL FORAGE RAPE

Extensive Forage



450+ mm 5.5 – 8.0 Most Soil Types

- Tall, fast establishing rape
- Excellent for both summer and winter feed
- Offers valuable feed opportunities for farmers wanting to finish stock
- Can be used as a summer crop where 1 to 2 grazings are required or as a late spring/early summer sown crop
- Strong frost tolerance and resistance to powdery mildew.

USING INTERVAL OR LEAFMORE

Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Summer Crop											
SOW											
			GRAZE								
			Winter Crop								
				SOW							
									GRAZE		
Maturity date: 56-84 days						Typical ME: 12 MJ/kg DM					
Typical yield: 5-8 t DM/ha						Sowing rate: 4 kg/ha					
(Maturity dates and yields depend on sowing time and number of grazings)											

LEAFMORE FORAGE RAPE

Extensive Forage



450+ mm 5.5 – 8.0 Heavy Loam and Clay

- Cross between Winfred and Emerald
- Superior cold growth habit and frost tolerance
- Vigorous establishment and high yielding
- Early maturity to first grazing (8-10 weeks)
- Suitable for autumn and spring sowing
- Excellent regrowth for up to 4 grazings
- Multi-stemmed with semi erect growth habit
- High forage quality with good leaf to stem ratio and high dry matter.

FORAGE BRASSICAS AND HERBS

Turnips

Brassica campestris

1 - 4 kg/ha

There is a great range in the types and maturity times of turnips. Tankard shaped varieties are suited to dairy and beef operations as they are often easily pulled out during grazing. Globe shaped types generally hold better in the ground and can be used for sheep as well as cattle. Maturity ranges from 10-12 weeks for vigorous, high yielding summer types, through to over 16 weeks for slower-growing, but higher yielding keeper types typically used for grazing in autumn and winter.

Summer turnips

2 - 3 kg/ha

DYNAMO TURNIP

Summer Feed



550+ mm 5.5 - 8.0 Most Soil Types

Dynamo is a globe shaped turnip providing a high yielding summer crop. It provides large volumes of low cost, quality feed when pasture quality and quantity declines. Dynamo produces a good level of bulb (around 45% of total yield), giving it an advantage in seasons when high levels of leaf diseases or pests are present. Ready to graze 10-14 weeks after sowing. Suits dairy systems, sheep and cattle.

USING DYNAMO					
Oct	Nov	Dec	Jan	Feb	Mar
SOW					
			GRAZE		
Maturity date: 60-90 days			Typical ME: 12-14 MJ/kg DM		
Typical yield: 8-12 t DM/ha			Sowing rate: 2-3 kg/ha		



FORAGE BRASSICAS AND HERBS

Leafy turnips

4 - 6 kg/ha

Brassica campestris spp rapa

These are a turnip/rape or turnip/cabbage cross that will grow a small bulb with high leaf yields. They provide the quickest feed, often in 6-8 weeks, and with good grazing management can offer multiple grazings. Leafy turnips can be sown from September to March. Feed will not keep however, and when ready the crop must be grazed, or they will typically bolt to flower. Newer varieties offer better stock acceptance, partly due to a smoother leaf surface.

FALCON

HYBRID LEAFY TURNIP

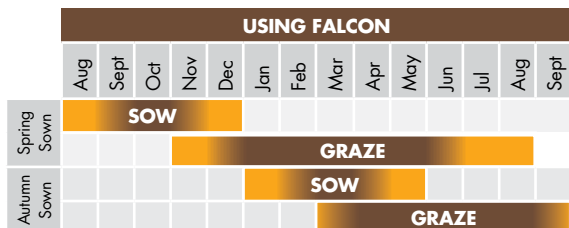


500+ mm 5.5 - 8.0 Most Soil Types

- Quick feed in 6-8 weeks - suits sowing from early spring to mid-autumn
- Excellent companion plant for spring or autumn sown annual forages
- A break crop as part of a pasture renovation program
- May be used in a mix with other species for specific outcomes, although has excellent feed quality attributes when sown as a sole variety
- Very suitable for dairy, finishing and extensive sheep and cattle enterprises.

Advantages over alternatives:

- 10-15% yield advantage over older varieties
- Improved early vigour
- High stock acceptance and improved palatability
- Excellent recovery from grazing.



- Most suitable
- Often suitable

FORAGE BRASSICAS AND HERBS

Swedes

Brassica napobrassica

1 - 4 kg/ha

Swedes are sown from November to January to provide autumn and winter feed for sheep and cattle. They offer the highest dry matter content amongst the brassica options. The bulbs keep very well, and can be an excellent option for feed budgeting in areas with cold winters. Slow growing, but good feed on offer after 20-24 weeks.

High yield swede

1 - 4 kg/ha

INVITATION

SWEDE

Winter Feed



550+ mm 5.5 - 8.0 Most Soil Types

Invitation is a late maturing yellow fleshed swede, with high bulb and leaf yield. Invitation produces excellent total DM yields with good dry rot tolerance and strong resistance to powdery mildew. Invitation produces high leaf yields (around 30% of total yield), which is helpful when introducing swedes into an animal's diet, particularly for younger stock. Invitation has shown high bulb keeping and leaf retention ability in trials, helping maintain its feed quality and quantity through to the end of winter.

USING INVITATION

Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
SOW										
								GRAZE		
Maturity date: 170-250 days					Typical ME: 12-14 MJ/kg DM					
Typical yield: 10-16 t DM/ha					Sowing rate: 0.5-0.8 kg/ha (ridged) Sowing rate: 0.8-1.5 kg/ha (drilled)					

FORAGE BRASSICAS AND HERBS

Kale

Brassica oleracea

3 - 5 kg/ha

Kale is normally sown from mid October to January to provide feed from mid autumn through winter. This is an erect plant, with the stem providing a high proportion of the feed on offer. Feed value is usually somewhere between that of turnips and rape, and high yields are possible. Kale keeps well in the cooler months and grazing time can be flexible. There is re-growth potential if 100-150mm of stem is left, although the first grazing constitutes the main target yield. Most varieties are quite tall and suit cattle only, whilst there are shorter types that suit sheep.

High quality kale

4 - 5 kg/ha

CALEDONIAN

KALE

Winter Feed



650+ mm 5.5 – 8.0 Most Soil Types

Caledonian is a tall, high yielding kale that provides excellent winter feed for cattle. Caledonian is a marrow stem variety, with soft nutritious stems that offer better ME and greater utilisation than other tall kales. The main difference is in the lower part of the stems. It has good winter hardiness and, like all kales, has good club root tolerance. Maturity in 5-7 months.

Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
SOW									
						GRAZE			
Maturity date: 150-220 days					Typical ME: 11-12 MJ/kg DM				
Typical yield: 12-16 t DM/ha					Sowing rate: 4-5 kg/ha				



FORAGE BRASSICAS AND HERBS

Forage Herbs

Chicory

Cichorium intybus

5 - 6 kg/ha

Chicory is a persistent leafy herb lasting 2-3 years with a large tap root. It performs best in fertile, free draining soils in regions of greater than 550mm rainfall. It has potential for high dry matter of excellent quality with most growth through warmer periods.

Chicory should be sown at 5-6kg/ha as a sole stand or at 1-2kg/ha as part of a grass clover mix. Often used as an annual (summer) forage in combination with millet, clover or forage brassicas.

Chicory requires a well prepared seed bed and soil temperatures of greater than 10°C for successful establishment. Chicory should be rotationally grazed on a 4-6 week rotation and will require added nitrogen for maximum performance.

Winter Active

COMMANDER

CHICORY



550+ mm 4.5 - 7.5 Most Soil Types

- Chicory for high performance sites
- 15-20% higher yield than prostrate types
- Performs all year round including winter
- Fast establishment and regrowth after grazing
- High quality winter active forage chicory
- Erect growth habit offers high utilisation
- Responds to summer rain and irrigation
- Low crown gives good persistence over 2-3 years
- Alternative to brassicas for summer forage
- Sown at 5-6 kg/ha with legumes and 1-2 kg/ha as part of a pasture mix.

Plantain

lantago lanceolata

3 - 5 kg/ha

A drought tolerant, deep tap-rooted perennial herb with high digestibility. Spring or autumn sown, with potential for year-round growth. Usually sown as a specialist paddock, as weed control options in mixed pastures may be limited. Has application in wet and slightly acidic sites where lucerne persistence may be compromised.

Vetch

Vetch is a winter and spring growing annual legume that is commonly used as a disease break in cereal cropping rotations. A multi-purpose crop, it offers high feed value and is ideal for hay production, early grazing as green pasture, dry grazing or green/brown manure.

Vetch is often sown in combination with cereals for quality hay. Vetch is often highly sought as a fodder to support dairying due to excellent quality and palatability.

It may be suitable for spring sowing in higher latitude, cold winter areas. Common vetch may be used for grain. Vetch has the ability to improve soil fertility by fixing large amounts of nitrogen (N) to the soil, which helps to meet the needs of following crops. It responds well to a wide range of soil types, however it does not tolerate water-logging.

There are a number of different vetch species, the most useful being:

Common vetch (*Vicia sativa*)

e.g. Morava, Rasina, Volga, Languedoc and Blanche fleur. Grazing, silage, hay, grain, larger seed size, lower % hard-seeded.

Woolly-pod vetch (*Vicia villosa*)

e.g. Capello, RM4, Haymaker and Namoi.
Grazing, silage, hay, smaller seed size, grain is toxic to stock: make hay before pod-set.
Generally higher % hard-seeded than common vetch.
15-20% higher hay yield potential than common vetch.

Purple vetch (*Vicia benghalensis*)

e.g. Popany and Early Popany.
Grazing, silage, hay, grain hard-seededness varies with cultivars.
(Outclassed by new common and woolly-pod types.)

Sowing time: As a rule of thumb, very often the best sowing window for a district coincides with barley sowing time:

Lower rainfall, spring dry areas April – May

Medium rainfall areas May – June

Higher rainfall/cold winter areas June – August (or later).

Inoculation: Group E inoculant ought to be applied to seed where vetch, peas or faba beans have not been grown previously.

Sowing rates: There is some variation in seed sizes: common vetch is the largest, woolly pod is the smallest, requiring allowance for seeding rate, depending on the species being sown. Target plant densities are usually from 40 to 70 plants/m².

Woolly pod vetch

15 - 30 kg/ha

Soft-Seeded

RM4

WOOLLY POD VETCH



E

375+ mm

5.0 - 8.0

Well Drained

- Best early vigour of all lines in SARDI research trials
- Long term average dry matter yield 108% of Capello
- Early maturity - can be cut for hay 10-15 days earlier than current varieties
- Good frost tolerance in international testing
- Soft seeded.

Soft-Seeded

CAPELLO

WOOLLY POD VETCH



E

375+ mm

5.0 - 8.0

Well Drained

- Softer seeded than other woolly pod vetches
- Reduces problems of volunteer vetch plants
- Suitable for grazing, hay and green manuring
- Highly efficient nitrogen fixation
- Offers a disease break in cropping rotations
- Can reduce black root rot in cotton rotations
- Resistance to spot, rust and ascochyta.

Hard-Seeded

HAYMAKER

WOOLLY POD VETCH



E

325+ mm

5.0 - 8.0

Well Drained

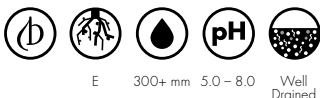
- Hard seeded, good regeneration from seed
- Selected for improved DM production over Namoi
- Suitable for grazing, hay and green manuring
- Highly efficient nitrogen fixation
- Offers a disease break in cropping rotations
- Resistance to spot, rust and ascochyta.

VETCH

Common vetch

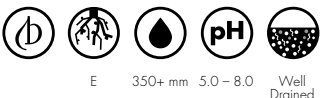
20 - 50 kg/ha

VOLGA COMMON VETCH



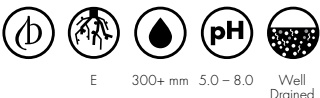
- High yielding, rust resistant common vetch variety
- Multi-purpose suitable for grain, hay/silage, grazing or green/brown manure
- Earlier in maturity by 7-12 days than Rasina (90-100 days from seeding to full flowering)
- Very good early establishment
- Moderately Resistant (MR) to ascochyta blight. Susceptible (S) to botrytis
- The best adapted vetch variety for grain and hay production in low-mid rainfall areas including SA Mallee, Mid North, Eyre Peninsula, Vic Mallee, Walpeup, Wimmera, NSW Central West and Rankin Springs.

MORAVA COMMON VETCH



- Resistant to rust and tolerant to ascochyta
- Replacement for all current varieties in areas with average rainfall above 300mm
- Soft seeded variety and non-shattering
- Vigorous early plant growth and good grazing palatability
- Produces more biomass than other varieties in medium - high rainfall zones.

RASINA COMMON VETCH



- Early in maturity by 10-15 days than Morava
- Very quick establishment and winter feed availability
- Replacement variety for Blanchefleur and Languedoc in low-medium rainfall areas
- Very good companion for hay cereals
- Higher grain yields compared to blanchefleur and Languedoc
- Resistance to rust and ascochyta
- Soft seeded variety and non shattering.



Forage Cereals

Forage cereals are quick to establish and relatively robust. They have strong winter and spring growth and well managed crops produce moderate to high quality feed that can either be directly grazed or cut and conserved as hay or silage. The Heritage Seeds' program of breeding and development that underlies the release of varieties is unmatched. New varieties are developed for tolerance to multiple grazing, high quality and high forage yields. Further evaluation in tough conditions means that these true forage cereals have the ability to perform as needed for the Australian grazing and forage industries.

Forage cereals are a group of species that are used for a specific seasonal grazing and/or fodder requirement. Whilst most cereals may offer some grazing or silage/hay making opportunity, true forage cereals are developed with traits that include:

- Rapid establishment
- Fast recovery from grazing
- Higher early season grazing yield
- Higher proportion of leaf over stem material
- Increased tillering capacity
- Generally higher feed quality and forage yield than grain-type cereals.

In most areas where winter feed with a subsequent fodder opportunity is needed, forage oats, triticale and barley may be planted from late summer through to mid-winter. Some oats and barley may also have application for late winter and early spring sowing in southern areas with excellent results. Where summer and early autumn feed is needed, forage sorghum and millet are also very useful options. These may also be conserved as silage or hay if required.

Forage cereals may play a significant role as a break crop as part of a pasture renovation program and at the same time provide a valuable feed source when other options may be unreliable. Cereal forage crops may be further enhanced by the inclusion of other species such as vetch, field peas, short-term ryegrass, annual clovers and forage brassicas.

Establishment

Forage cereals are well suited to sowing into either a prepared seed bed, or more commonly, by direct drilling into spray-fallows or crop residues. Consider the paddock history, or conduct a soil test to determine fertiliser requirement. However, a modest application of DAP or similar at the time of planting is usually beneficial. Consider the options for pre-emergent herbicides and insecticides where appropriate, as they will give the crop the best chance to out-compete pests. In heavy trash situations, incorporating an early application of a molluscicide for slugs or snails may be necessary.

Sowing depth should be between 10-35mm, although slightly deeper sowing is often still satisfactory. Assess the crop for weeds again when it has developed 3-4 true leaves and treat accordingly. Forage cereal crops are generally ready for a light first grazing when 20-25cm high, down to about 10cm. This will be around 6-8 weeks after sowing depending on conditions, and the crop can be allowed to re-grow for multiple subsequent grazings.

	500mm rainfall	600mm rainfall	700mm rainfall	800mm rainfall	Irrigation
SOWING RATES KG/HA	40-60	70-90	80-90	80-100	100-120

Grazing Management

True forage cereals are developed to withstand grazing pressure and can be grazed through winter, with minimal loss of total forage yield if grazed correctly. The crop should only be grazed when the roots have developed sufficiently to anchor the plants so that they will not pull out. This is generally the case once the crop has reached 25cm in height. Ideally the crop should be grazed before the first node has developed, to avoid the loss of the nodes and resulting tiller death. As a rough guide the crop should be grazed at a height of 25-30cm.

How Hard to Graze

Post-grazing height is critical in maintaining crop yield. The crop should be grazed to no lower than 10cm or just above the first node. If the first node is removed, regrowth will be significantly reduced as the removal of the node will result in the death of that tiller. True forage cereals do have the ability to re-tiller post-grazing. However, this regrowth will be slower than growth from established tillers, resulting in lost production.

Ongoing Management

Rotational grazing is the best way to maximise crop production and the crop can be re-grazed each time it reaches 25-30cm in height. As the crop progresses, it is inevitable that the nodes will begin to rise and additional care must be taken to avoid over-grazing and tiller death. Grazing crops at these later stages of development will most likely reduce the yield at final harvest. Set-stocking of forage cereal crops will often give the best results for fattening cattle, particularly in northern Australia. For best results the stocking rate needs to be adjusted depending on the growing conditions and growth rate of the crop.

Adverse Conditions

Grazing when the soil is very wet will result in crown and root damage, and recovery and total yield will be reduced. If conditions become very dry, grazing to 10cm to remove leaf tissue may aid survival by reducing evapotranspiration.



Forage oats

60 - 120 kg/ha

Avena sativa

Forage oats are a broadly adapted and reliable winter forage crop and are the most widely used of the forage cereals.

Forage oats are easy to establish and are the only true forage cereal that can be sown in late summer and early autumn, giving forage oats the highest potential yield of the forage cereals.

Forage oats have a winter habit – growth will slow over the colder months and are slow to establish if sown too late. They produce reasonably well from a late winter/early spring planting given a higher sowing rate. In southern Australia, barley yellow dwarf virus (BYDV) is a significant disease, limiting production in susceptible varieties.

True Forage Cereal

WIZARD

FORAGE OAT



400+ mm 4.5 – 8.0 Most Soil Types

- New release
- Sets a new benchmark in yield – 9% over Aladdin and Genie, 15% over Drover and Taipan
- Good early growth
- Excellent recovery from grazing and cutting
- Currently resistant to all Australian pathotypes of leaf rust
- Medium maturity
- Well suited to northern climate zones.



FORAGES

ALADDIN FORAGE OAT



400+ mm 4.5 – 8.0 Most Soil Types

- Very high forage yield under dryland and irrigated conditions
- Good recovery from grazing and will tolerate heavy grazing
- Late maturity helps to keep quality through the season
- Suits northern climate zones
- Susceptible to leaf rust
- Superseded by Wizard.

GENIE FORAGE OAT



400+ mm 4.5 – 8.0 Most Soil Types

- Excellent seedling vigour leading to more early growth
- Very late maturity which stays leafy into late spring
- High yielding = more feed
- Suits northern climate zones.

MAMMOTH FORAGE OAT



400+ mm 4.5 – 8.0 Most Soil Types

- True forage oat
- Exceptional early vigour
- High winter and good overall yield
- High quality, leafy feed
- Excellent BYDV tolerance
- Suitable for grazing, silage and hay
- Suits southern climate zones.

Forage triticale

X Triticosecale

60 - 120 kg/ha

Triticale is a cross between wheat and cereal rye or rye corn. Combining the quality and yield of wheat and the broad adaptability of rye, triticale is an extremely hardy and adaptable species. It has good disease resistance and is suited to a wide range of climates and growing conditions including light, sandy soil. It can also tolerate acid soils and waterlogging better than other forage cereal species, and has a more developed root system, giving better suitability to light soils.

The reliable grain yield of triticale is the key factor in its use for whole crop silage production. With whole crop silage the crop is taken through to near maturity and while other cereals lose feed quality rapidly after emergence and continue to fall, the quality of triticale climbs again as the grain fills.

True Forage Cereal

CRACKERJACK 2

FORAGE TRITICALE



450+ mm 4.8 – 8.0 Most Soil Types

- Mid/late maturity
- Stripe rust resistant
- Very high forage yield or whole crop silage option
- Excellent winter vigour
- Very good resistance to lodging
- Long and broad leaves
- Can be sown earlier than the original Crackerjack.



FORAGES

Forage barley

60 - 100 kg/ha

Hordeum vulgare (H. distichum L)

Barley has fast establishment and high winter production. It is best suited to late planting situations where its quick early growth under cold conditions is an advantage over other forage cereals. Barley provides excellent forage for grazing, hay or silage, with good forage quality. The later planting window gives more flexibility with late finishing crops like maize and earlier finish gives the best chance of getting the summer crops sown early into adequate soil moisture.

DICTATOR 2

FORAGE BARLEY

True Forage Cereal



450+ mm 5.4 – 8.0 Most Soil Types

- True forage barley bred to replace Dictator
- Fastest winter growth of all true forage cereals
- Ideal for late sowing
- Rapid establishment and early growth
- Quick regrowth after grazing
- Awnless – suits haymaking as well as silage
- Highest feed quality of forage cereal options:
- Higher Metabolisable Energy (ME)
- Lower Neutral Detergent Fibre (NDF)
- Very high stock acceptance.

Forage wheat

60 - 100 kg/ha

Triticum aestivum

Long-season wheat varieties offer high quality winter grazing with the potential for silage. Awnless varieties are also suitable for hay. Einstein wheat (p.173) is a suitable variety for grazing, grain, silage or hay. Dry matter yield through autumn and winter is typically less than the potential offered by other cereal species.

Cereal rye (ryecorn)

40 - 60 kg/ha

Secale cereale

Rye has the potential for quick winter feed for a late sowing window, and may be used as a cover crop in some lighter-soil situations. Feed value declines rapidly from late winter and rye crops should be terminated before spring, as silage or hay have poor stock acceptance, very high fibre and little feed value.

Forage sorghum

15 - 30 kg/ha

Sorghum spp.

A warm-season, annual grass used for strip grazing, silage and hay, capable of very high yields under the right conditions. Irrigation usually essential for best performance. There are many varieties, hybrids and sub-types - select with care to suit your conditions. In southern Australia, cool tolerant varieties should be used. It should be sown when soil temperature is over 16°C and rising. Crops less than 50cm high or under drought or other stresses may create issues with prussic acid poisoning, depending on the condition of the crop and the variety.

Hybrid forage sorghum

- Typically fast to graze: 7 to 8 weeks
- Prussic acid risk
- Medium stem thickness.

Sudan grasses

- Lower yield than hybrid forage sorghums
- Fine stems
- Quicker initial growth
- Lower prussic acid risk.

Sweet sorghum

- Retain feed value and palatability as they mature
- Thick stems
- Higher levels of prussic acid during early growth
- Used for silage and stand-over feed.

FORAGES

Sorghum x Sudan Grass Hybrid

ASTRO

FORAGE SORGHUM



350+ mm 4.8 – 7.5 Most Soil Types

- Photo-period sensitive with ultra-late flowering
- Exceptional forage yields with rapid re-grazing intervals
- Ideal for grazing, silage or hay production.

Sudan x Sudan Grass Hybrid

CENTAUR

FORAGE SORGHUM



350+ mm 4.8 – 7.5 Most Soil Types

- Fine stemmed for improved conservation quality
- Photo-period sensitive with delayed flowering
- Recovers fast after grazing
- Good option as a forage or for green manure crops.

Sweet Sorghum x Sorghum Sudan Hybrid

SUGAR SWEET

FORAGE SORGHUM



350+ mm 4.8 – 7.5 Most Soil Types

- High energy feed with superior sugar content
- Quality increases with maturity
- Versatile planting window (early-late) and fine stems ensure low waste
- Suited to beef grazing, carry over feed and silage.

Forage millet

4 - 25 kg/ha

This name is applied to a number of species of which Pearl and Japanese are the most important. Millet is used as a fast, reliable summer forage that may also be taken for silage or hay. Usually sown in late spring as millet does not tolerate frost. Often used as a summer forage or hay/silage crop in summer irrigated areas. It can be sown alone or mixed with rape, turnips or chicory. Ready for grazing in about 6-8 weeks after sowing. Millet is very palatable and free of prussic acid. Millets also have application for cover crops in some turf and pasture situations, particularly in erosion-prone areas of northern Australia.

PEARLER

HYBRID PENNISETUM

Hybrid Pennisetum



375+ mm 4.3 – 8.0 Most Soil Types

- Hybrid with improved growth rates and overall yields
- Very rapid regrowth for subsequent grazing or cutting
- Similar feed qualities as forage oats
- No prussic acid: safe for grazing at any stage
- Smaller seed size with lower sowing rates than other options:

Dryland: 4 - 8 kg/ha

Good Country/irrigation: 10 - 15 kg/ha

Pearl millet

4 - 15 kg/ha

Pennisetum glaucum

Pearl millet has the capacity to grow very high forage yields. It is the preferred option for the warm sub-tropical and tropical north as pearl millet generally well-out performs Japanese types. Pearl millet should be sown at a soil temperature of 16°C and rising, preferable 18°C.

Japanese millet

8 - 20 kg/ha

Echinochloa esculenta

A warm-season, fast growing annual grass. Needs soil temperatures of 14°C and rising for good germination. Often grain producing varieties are referred to as 'Jap' Millet. The variety Shirohie has improved forage attributes and is the most widely used for grazing and fodder. It is also the most useful variety for southern areas.

Siberian millet

8 - 25 kg/ha

Echinochloa frumentacea

A warm-season, slower-maturity species with a more prostrate habit. It has a high tiller density and recovers well from grazing or machine harvesting. Siberian millet should be sown once soil temperatures are over 16°C and is most suitable for areas with a mild start to spring and long, warm summers.

Tropicals

The northern research team is based in Toowoomba and has four primary sites at Gatton, Oakey, Kingaroy and Blanchview.

In addition, secondary trial sites are located at Mareeba, Charters Towers, Emerald, Rockhampton, Moree, Coonabarabran, Grafton, Northern WA and NT. These sites are used to test the 'area adaptability' of each variety.

During the past decade Heritage Seeds has been working on improving a range of grasses including Rhodes, brachiaria, buffel, digit, tall fescue, panic and bluegrass.

Recent releases include two new lines of *Megathyrsus maximus* (Megamax™049 and Megamax™059) that are suited to coastal regions and the dry tropics. Two new burgundy beans (Garnet and Presto) have also been released further complementing our tropical legume range.



EBONY PR

COWPEA

Multi-Graze Cowpea



400+ mm 4.0 – 7.0 Wide Range

- An extremely versatile summer forage providing good grazing, hay and silage options
- Prostrate growth habit that can withstand multiple grazing
- Improved root and stem rot resistance
- Great source of nitrogen fixation in summer rotation
- Ideal for producing high quality summer finishing feed
- Nil prussic acid poisoning issues
- Suitable as a companion legume with millet and forage sorghum.

PRESTO

BURGUNDY BEAN

Multi-Purpose Legume



400+ mm 4.5 – 8.0 Light to Heavy

- Earlier flowering season burgundy bean
- Capable of producing feed later in the season
- Palatable, high protein legume suited to short season regions.

GARNET

BURGUNDY BEAN

Multi-Purpose Legume



400+ mm 4.5 – 8.0 Light to Heavy

- Produces forage late into the season
- Capable of having some regeneration from plants and seeds
- Highly palatable, high protein feed source.

SIRAN

STYLO

High Protein Legume



450+ mm 4.5 – 7.0 Light

- An erect shrubby perennial that can grow up to two metres tall
- Exhibits greater anthracnose tolerance than Seca
- Widely adapted and can persist under heavy grazing
- Shows good tolerance to drought and is suited to a wet-dry climate
- Produces large quantities of highly nutritious feed for the dry season.

AMIGA

STYLO

High Protein Legume



400+ mm 5.4 – 8.0 Light

- Highly palatable and persistent Verano-type stylo
- Suited to cooler more arid regions of the tropics
- Easy to establish
- Produces an abundance of seed.

LAKOTA

BUFFEL GRASS



300+ mm 5.5 – 8.0 Light to Medium

- Good early feed coming out of winter
- A degree of cold tolerance for western regions
- Highly productive in a range of soil types.

MULATO II

HYBRID BRACHIARIA



700+ mm 5.0 – 8.0 Most Soil Types

- Suitable for environments generally considered outside the normal adaptation range for many Brachiaria species
- Will tolerate acid soils of high aluminum
- Forage yields recorded up to 27mt DM/ha/year and 17% crude protein
- Very palatable, grazing and drought tolerant
- Recommended for cattle, sheep and goats
- Suitable for direct grazing, cut-and-carry methods, bailing and ensilage.

MEGAMAX™059

PANIC GRASS

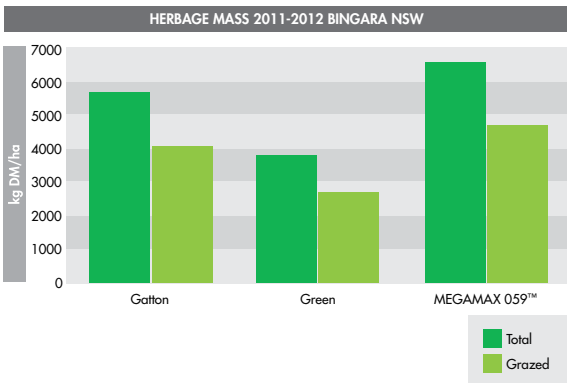


550+ mm 5.0 – 8.0 Most Soil Types

- New release
- Increased yield and production
- Higher persistence
- Larger leaves
- Strong tillering capacity
- Improved forage quality and grazing tolerance.

Performance

Herbage production expressed as dry matter for Bingara NSW showing grazed and production.



Quality

Forage quality data collected at Tamworth NSW clearly demonstrates the high quality of Megamax™059 vs superseded Gatton and Green cv.

Cv/Line	NDF (%)	ADF (%)	CP (%)	DMD (%)
MEGAMAX 059™	59.1	27.7	14.3	65.2
Gatton	58.9	24.6	13.3	63.2
Green	63.7	29.0	14.1	63.3

TROPICALS

BILOELA BUFFEL BUFFEL GRASS



350+ mm 5.5 – 8.0 Light to Heavy

- Taller, more robust buffel, later maturity
- Suited to heavy soil types
- Greater drought tolerance.

GAYNDAH BUFFEL BUFFEL GRASS



350+ mm 5.5 – 8.0 Light to Medium

- Finer, medium height buffel that establishes readily
- Adapted to a wide range of soil types, medium maturity
- Good stock tolerance.

USA BUFFEL BUFFEL GRASS



350+ mm 5.5 – 8.0 Light to Medium

- Fine stemmed, medium height, dense variety
- Early maturity, purple flowers
- Suitable for lighter, textured, well drained soils.

CREEPING BLUEGRASS

(Bisset/Hatch)



600+ mm 5.0 – 7.0 Wide Range

- A hardy grass that will invade speargrass and establish on clays
- Bisset is finer leaved and roots down more strongly than Hatch
- Good for erosion control.

FLOREN BLUEGRASS



500+ mm 5.5 – 8.0 Basaltic Clays

- Thrives on heavy soils and periodic inundation
- Forms large tussocks and will compete with weeds once established
- Highly palatable.

CONSOL LOVEGRASS



500+ mm 4.0 – 6.0 Light Soils

- Highly persistent on light sandy soils
- Tolerant of low pH and high exchangeable aluminium
- Requires intensive grazing management to maintain feed quality.

HUMIDICOLA TULLY GRASS



1000+ mm 4.5 – 7.5 Wide Range

- Highly stoloniferous and can tolerate prolonged waterlogging
- Vigorous and dense mat forming growth habit
- Withstands heavy grazing with minimal weed invasion.

BAMBATSII PANIC GRASS



450+ mm 5.5 – 8.0 Clay Loams

- High yielding and palatable perennial grass
- Distinctive bluish leaves with prominent white mid rib
- Tolerates saline soils, waterlogging, drought conditions and has some tolerance to frost. Also tolerates heavy black clays and melon hole country.

GATTON PANIC GRASS



550+ mm 5.5 – 8.0 Fertile and Lighter

- Very palatable, shade tolerant grass with broad green leaves
- More vigorous and drought tolerant than green panic
- Suited to sub-tropical areas with fertile, well drained soils.

GREEN PANIC GRASS



550+ mm 5.5 – 8.0 Fertile and Lighter

- One of the most palatable tropical species
- Suited to higher rainfall regions and fertile well drained soils
- Needs to be managed well, doesn't handle heavy grazing

TROPICALS

DILATATUM PASPALUM



800+ mm 5.5 – 8.0 Wide Range

- Palatable, tufted perennial grass
- Best suited to high fertility soils, moderate frost tolerance
- Good grazing tolerance, with quick return after grazing.

WETTSTEINII PASPALUM



800+ mm 4.5 – 8.0 Wide Range

- Palatable, productive perennial with a stoloniferous habit
- Tolerant of a wide range of soils including poor drainage
- Moderate frost tolerance, good flooding and is shade tolerant.

PREMIER DIGIT GRASS



400+ mm 5.5 – 8.0 Light

- Highly productive, robust tufted perennial that is palatable and persistent
- Well adapted to inland regions with lower rainfall and has some frost tolerance
- Drought, fire and cold tolerance
- Low in oxalate.

CALLIDE RHODES GRASS



650+ mm 5.5 – 8.0 Wide Range

- Highly palatable, very late flowering and productive stoloniferous grass
- Well suited to companion legumes such as Siratro and burgundy bean
- Ideal for quality grazing and/or hay making.

KATAMBORA RHODES GRASS



550+ mm 5.5 – 8.0 Wide Range

- Highly stoloniferous, versatile and earlier flowering than Callide
- Greater drought tolerance and ability to grow on lower fertility soils
- Withstands soil/moisture variations and periodic waterlogging
- Finer and more palatable than old Pioneer type.

SPLENDA SETARIA



800+ mm 5.0 – 7.0 Wide Range

- Hardy, high yielding and later maturing. Suited to the sub-tropical regions
- Very palatable. May be heavily grazed without risk of plant death
- Relatively frost tolerant, withstands waterlogging.

SIGNAL GRASS SIGNAL GRASS



800+ mm 4.5 – 7.0 Wide Range

- Forms a dense, high yielding sward, tolerates heavy grazing
- Has an aggressive stoloniferous root system and long trailing stems
- Best suited to humid tropical, high rainfall regions.

UROCHOLA SABI GRASS



500+ mm 5.0 – 8.0 Wide Range

- Palatable, hardy and quick to establish perennial tropical grass
- Well suited to the dry tropics
- Responds well to rainfall and grows in a range of well drained soil types.

TROPICALS

Tropical Sowing Guide

Variety	Rainfall (mm)	Preferred Soil Type	Water-logging	Frost	Drought
Bambatsii Panic	500	Clay loams	Good	Good	V.Good
Buffel Grass - USA, Gayndah, Biloela	350	Light to medium soil types, however, Biloela tolerates heavier soil types	Poor	Poor to Fair	V.Good
Consol Lovegrass	350	Light soils	Poor	Fair	Good
Creeping Bluegrass - Bissett - Hatch	600	Wide ranging, tolerates lower fertility	Poor	Fair	Fair
Floren Bluegrass	550	Basaltic clays and heavy alluvial soil	Good	Fair	Fair
Panic Grass - Green - Gatton	650	Fertile and lighter	Poor	Fair	Fair
Panic Grass - Megamax™ 059	550	Fertile and lighter	Poor	Fair	Fair
Humidicola* - Tully Grass	1000	Varying, tolerates lower fertility	Good	Poor	Fair
Indian Bluegrass	500	Varying	Poor	Fair	V.Good
Kikuyu Grass - Whittet	1000	Red loams and basaltic soils	Good	Good	Fair
Premier Digitaria	500	Lighter soil types	Poor	Fair	V.Good
Paspalum*	750	Fertile soil types	Good	Good	Fair
Purple Pigeon Grass	600	Self-mulching clays	Good	Good	V.Good
Rhodes Grass - Katambora, Callide	650	A wider range of light to medium soil types	Fair	Fair	Fair
Setaria Grass - Splenda Narok, Solander, Kazungula	800	Varying	V.Good	Good	Fair
Signal Grass*	800	Varying	Fair	Poor	Good
Urochloa - Sabi Grass	500	Varying	Fair	Poor	Good

* Available as bare seed only

Planting Rate (kg/Ha) AgriCote			Comments
Marginal Dryland	Good Dryland	Irrigated	
3-5	8-12	12-15	Cool season greenness, tolerates heavy grazing, heavy black soils, periodic water-logging and saline areas.
4-6	8-12	12-15	Deep rooted, drought tolerant sub-tropical grass, that is hardy and productive with high fertility.
4-6	8-12	12-15	Highly persistent on light, sandy soils. Not highly palatable.
6-8	10-12	12-15	A hardy grass that will invade speargrass and establish on clays. Bisset is finer leaved and roots down more strongly than Hatch. Good for erosion control.
2-3	6-8	10-12	Used to re-grass flood plains colonised by lippia.
3-6	10-12	12-15	Grows best on high fertility soils. Gatton panic tolerates textured soil types and shade, but can be preferentially grazed. Green panic more tolerant of shade.
3-6	10-12	12-15	Improved persistence over other panic grasses with improved forage quality and cool season growth.
4-6	8-12	12-15	Adapted better to wetter, lower lying areas than signal grass. Will invade and outcompete giant rats tail grass.
4-6	8-12	12-15	A hardy, free seeding plant spread widely throughout tropical and sub-tropical areas.
2-3	8-12	12-15	Has high fertility requirements and does best in moist and elevated, fertile basaltic tablelands.
4-6	8-12	12-15	Perennial tufted grass suited to acidic, sandy soils of low fertility.
2-5	8-12	12-15	Palatable, tufted, grazing tolerant perennial grass best suited to higher fertility, high rainfall areas.
4-6	8-12	12-15	Medium term perennial suited to self-mulching clays.
5-7	8-12	15-20	Katambora is a productive diploid, highly stoloniferous grass, suitable for erosion control. Callide is a productive tetraploid, palatable grass suited to fertile soils and higher rainfall environments. NB: All Rhodes grasses are quick to establish and have moderate salt tolerance.
2-6	8-12	12-15	Hardy and palatable coastal grass well suited to sub-tropical regions.
2-6	8-10	12-15	Valuable grass in the wet tropics, when nitrogen fertilised.
2-6	8-10	12-15	Low growing, tufted, stoloniferous, perennial grass with a creeping growth habit. Used in tropical cattle grazing systems, roadside stabilisation, erosion control and mine rehabilitation.

TROPICALS

Legume Over-planting	Minimum Rainfall (mm)	Drought Tolerance	Frost Tolerance
Burgundy Bean (Presto/Garnet)	400	Good	Fair
Centro (Cavalcade)	800	Good	Poor
Desmanthus	500	Good	Fair
Glycine (Tinaroo/Cooper)	750	Good	Fair
Greenleaf Desmodium	500	Poor	Fair
Jointvetch (Lee)	1200	Poor	Poor
Leucaena (Cunningham)	600	V.Good	Fair
Lucerne (SARDI range)	400	V.Good	V.Good
Medic Burr (Scimitar)	350	Good	Good
Medic Barrel (Paraggio/Jester/Sultan-SU)	350	Good	V.Good
Medic Snail (Sava)	350	Good	Good
Milgarra Butterfly Pea	550	Good	Poor
Peanut (Pinto/Amarillo)	1000	Fair	Fair
Shaw Creeping Vigna	1200	Poor	Poor
Siratro (Aztec)	700	Good	Poor
Stylo Shrubby (Seca/Siran) – Scabra type	350	V.Good	Poor
Stylo Caribbean (Verano/Amiga) – Hamata type	400	Good	Fair
Stylo Fine Stem	700–900	V.Good	Fair
White Clover (Haifa/Storm)	800	Good	Fair
Wynn Cassia	400	V.Good	Fair

- Alfalfa sowing rates for pure stands
- Marginal Dryland: 6-8 kg/Ha
- Good Dryland: 10-12 kg/Ha
- Irrigated: 22-25 kg/Ha

TROPICALS

Water-logging	Preferred Soil Type	Planting Rate (kg/Ha) AgriCote OVERSOW	Planting Time
Fair	Light+Heavy	3-4	Spring/Summer
V.Good	Fertile soil types	3-8	Spring/Summer
Poor	Medium-Heavy	2-4	Spring/Summer
Poor	Medium-Heavy	3-8	Spring/Summer
Good	Light+Medium	2-4	Spring/Summer
V.Good	Light+Heavy	2-4	Spring/Summer
Poor	Well drained, fertile soils	4-6	Spring/Summer
Poor	Light+Medium	1	Autumn/Spring
Fair	Medium-Heavy	2-4	Autumn/Spring
Fair	Light+Heavy	2-4	Autumn/Spring
Fair	Medium-Heavy	2-4	Autumn/Spring
Fair	Medium-Heavy	4	Spring/Summer
Fair	Medium-Heavy	8-12	Spring/Summer
Good	Medium-Heavy	1-2	Spring/Summer
Fair	Medium-Heavy	3-8	Spring/Summer
Fair	Light	1-5	Spring/Summer
Fair	Light	1-5	Spring/Summer
Poor	Light+Medium	2-5	Spring/Summer
Good	Medium-Heavy	2-6	Autumn/Spring
Poor	Light+Medium	3	Spring/Summer

Tropical Meatmaster Blends

Premium Pasture Blends for Tropical Australia

MEATMASTER PRIME PASTURE

PREMIUM PASTURE BLENDS

This mix is suited to the heavier black, self-mulching and grey-cracking flood plain soil types. The productivity of Katambora Rhodes grass, Bambatsii panic grass and Megamax™059 panic grass is enhanced by the adaptation to the soil type. The late season of the grasses is complemented by a legume component to keep protein in the pasture and nitrogen cycling. This is a very productive mix for finishing cattle in summer, whilst building a large volume of good stand over feed for the winter months.

VARIETY	SPECIES	%
Katambora Rhodes	Rhodes grass	30
Megamax™059	Panic grass	20
Bambatsii Panic	Panic grass	20
SARDI-Grazer	Lucerne	10
Medic Mix	Medic	10
Burgundy Bean	Burgundy bean	10
Sowing rate: 6-10 kg/ha		

MEATMASTER BIG BEEF BLEND

PREMIUM PASTURE BLENDS

This mix is developed for the medium black to red/chocolate soils. The productivity of the Katambora Rhodes grass and Megamax™059 panic grass is enhanced by creeping bluegrass, with its stoloniferous growth pattern allowing good ground cover and moisture holding capacity. The mix of both winter and summer active legumes enables the feed gap to be filled over winter.

VARIETY	SPECIES	%
Katambora Rhodes	Rhodes grass	30
Megamax™059	Panic grass	25
Creeping Bluegrass	Bluegrass	15
SARDI-Grazer	Lucerne	20
Burgundy Bean	Burgundy bean	10
Sowing rate: 8-12 kg/ha		

MEATMASTER WESTERN LIGHT SOIL MIX

PREMIUM PASTURE BLENDS

This mix consists of a blend of USA buffel for lighter country and Gayndah buffel for the red/grey loams. The use of sabi grass, for vigorous establishment plus stylo and burgundy bean complement the mix, enabling protein levels to be maintained in the dry winter. This mix will cover lighter soils encountered in the western Queensland area in the 350-450 mm rainfall category.

VARIETY	SPECIES	%
USA Buffel	Buffel grass	30
Gayndah Buffel	Buffel grass	30
Burgundy Bean	Burgundy bean	10
Mega Stylo	Stylo	15
Sabi Grass	Sabi grass	15
Sowing rate: 6-10 kg/ha		

MEATMASTER PREMIUM COASTAL MIX

PREMIUM PASTURE BLENDS

This coastal beef blend is well suited to sub-tropical regions and consists of hardy and palatable coastal grasses and a good percentage of tropical legumes to even out production.

VARIETY	SPECIES	%
Callide Rhodes	Rhodes grass	45
Splenda Setaria	Setaria	20
Signal Grass	Signal grass	20
Burgundy Bean	Burgundy bean	15
Sowing rate: 7-10 kg/ha		



MEATMASTER SLOPES AND PLAINS MIX

PREMIUM PASTURE BLENDS

This mix was developed for the medium black to chocolate and red soils of the New South Wales slopes and plains. Bambatsii panic grass and Megamax™059 panic grass combine for soft, leafy productivity on the heavier soils, with digit grass and Rhodes grasses performing and persisting on the lighter soil.

VARIETY	SPECIES	%
Katambora Rhodes	Rhodes grass	15
Premier Digit	Digitaria	40
Bambatsii Panic	Panic grass	25
Megamax™059	Panic grass	20

Sowing rate: 7-10 kg/ha depending on situation

MEATMASTER FLOOD PLAIN ALLGRASS

PREMIUM PASTURE BLENDS

This blend is suited to the heavier, cracking, black and grey soils of flood plain country. The productivity of Katambora Rhodes grass and Bambatsii panic grass is enhanced by the black soil adaptation of Floren bluegrass, increasing persistence and ground cover in very wet or dry conditions. A very productive mix for finishing cattle in summer or building a large volume of good standover feed.

VARIETY	SPECIES	%
Katambora Rhodes	Rhodes grass	30
Bambatsii Panic	Panic grass	40
Floren Bluegrass	Bluegrass	30

Sowing rate: 7-10 kg/ha depending on situation

EQUIMASTER PREMIUM HORSE BLEND

PREMIUM PASTURE BLENDS

This blend is specifically for the horse enthusiast. It ensures safety to the animal as all grasses are low in oxalate and can handle the grazing pressure. The use of both tufted and stoloniferous grass species allow the pastures to fill in quickly, producing a large ground cover. The legume component consists of lucerne and burgundy bean for both summer and winter production. The millet will help with quick ground cover and protect juvenile plants from heat stress and frost or cold shock.

VARIETY	SPECIES	%
Rhodes Grass	Rhodes grass	40
Creeping Bluegrass	Bluegrass	15
Premier Digit	Digitaria	15
SARDI-Grazer	Lucerne	10
Burgundy Bean	Burgundy bean	10
Shirohie	Millet	10

Sowing rate: 12-20 kg/ha



TRADED VARIETIES

Ryegrasses

VICTORIAN PERENNIAL RYEGRASS

Diploid



600-
650+

4.8 - 8.0

Most Soil
Types

- Early heading ryegrass with generally reliable persistence
- Suited to marginal ryegrass regions with lower rainfall
- Significantly lower production and quality than most modern ryegrasses.

NUI PERENNIAL RYEGRASS

Diploid



650+ mm

4.8 - 8.0

Most Soil
Types

- 1970s perennial selection from New Zealand
- Superseded by improved plant breeding in the 1980s and onwards
- Sometimes used where price is more important than productivity.

TETILA ANNUAL RYEGRASS

Tetraploid



600-
700+

5.0 - 8.0

Most Soil
Types

- Various types are available, usually only available uncertified
- Suitable for quick autumn and winter feed.

WIMMERA ANNUAL RYEGRASS

Diploid



350+ mm

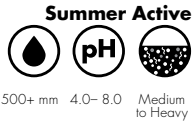
4.8 - 8.0

Most Soil
Types

- Occasionally used in winter rainfall dominant, summer dry areas
- Regenerates through lax grazing and self-seeding.

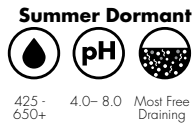
Other Grasses

DEMETER TALL FESCUE



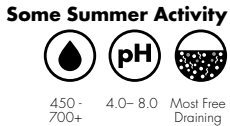
- Hardy old variety from 1960s and 70s with good drought tolerance
- Tougher leaves than modern types, and stock acceptance can be problematic.

CURRIE COCKSFOOT



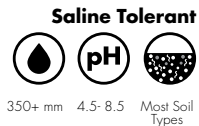
- Mediterranean but not completely summer dormant
- Well adapted to a wide range of soils
- Not as palatable as Porto
- Persists better on sandy soils than Porto.

PORTO COCKSFOOT



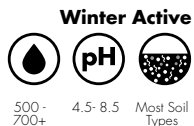
- Intermediate type, late maturing, perennial grass
- Good seedling vigour and early growth
- Very productive in the higher rainfall zones (700mm+).

TYRELL TALL WHEAT GRASS



- Perennial for use in saline, wet areas to aid soil conservation
- Allow to grow spring and summer, to reduce recharge.
- Graze in autumn, more productive than Puccinellia.

HOLDFAST PHALARIS



- Semi erect to erect winter active variety
- Good seedling vigour
- Bred by the CSIRO breeding program
- Good tolerance to acid soils.

TRADED VARIETIES

SIROSA PHALARIS

Winter Active



500 -
700+

5.5 - 8.5

Most Soil
Types

- Semi-erect winter active variety
- Variable growth habit – more erect than Australian
- Outclassed by the more persistent Holdfast.

AUSTRALIAN PHALARIS

Semi-Winter Dormant



425+ mm

5.0 - 8.5

Most Soil
Types

- Poor seedling vigour, low crowned prostrate cultivar that grows in autumn and spring and fairly well in winter
- Persists well, particularly under set-stocking
- Outclassed by Australian II.

Traded Pasture Legumes

HAIFA WHITE CLOVER

Large Leafed



B or
AgriCote

700 -
850+

4.7 - 7.0

Most
Heavy

- Large-leaved, upright variety
- Performs well in warm temperate and sub-tropical areas
- Good heat tolerance and seed setting ability.

PITAU WHITE CLOVER

Medium-Large Leafed



B or
AgriCote

650+ mm

5.4 - 8.0

Wide
Range

- Medium-leaved, semi-prostrate variety
- Suits set-stocking, mixed grazing in cool temperate areas
- Known for persistence, however now outclassed by newer breeding.

HUIA WHITE CLOVER

Medium Leafed



B or
AgriCote

650+ mm

5.4 - 8.0

Wide
Range

- Medium-large leaved variety with flexible growth habit depending on management
- Suits rotational grazing, cool climate
- Sometimes marketed as New Zealand White or Wild-White.

TRADED VARIETIES

HAMUA RED CLOVER



B or
AgriCote



650+ mm



5.8 – 8.0



Medium -
Heavy

Large Leafed

- Large-leaved, upright variety, summer active
- Performs well on medium-heavy soils with good fertility
- Sometimes called NZ Red or Cow-grass.

PALESTINE STRAWBERRY CLOVER



B or
AgriCote



500 -
700+



6.0 – 8.5



Most Soil
Types

Hard Seeded

- Prostrate growing perennial clover with vigorous spring/summer growth
- More productive than O'Connors in winter and early spring
- Withstands waterlogging and saline conditions.

O'CONNORS STRAWBERRY CLOVER



B or
AgriCote



500 -
700+



6.0 – 8.5



Medium
to Heavy

Hard Seeded

- Finer stems, leaves and smaller seed than Palestine
- Generally a more prostrate variety, widely used in lawns
- Can withstand heavy grazing and cutting.

NUNGARIN SUBTERRANEUM CLOVER



C or
AgriCote



250 -
400+



4.5 - 7.0



Medium
to Light

Black Seeded

- Early season maturity – 77 days to flowering (Perth)
- Very high levels of hard seed and seed yield
- Still a useful cultivar for marginal rainfall areas.

DALKEITH SUBTERRANEUM CLOVER



C or
AgriCote



350 -
650+



4.5 – 7.0



Medium
to Light

Black Seeded

- Early season maturity – 97 days to flowering (Perth)
- Good early root growth and establishment
- Susceptible to clover scorch
- Our improved alternative is Losa.

TRADED VARIETIES

SEATON PARK SUBTERRANEUM CLOVER



C or
AgriCote



475 -
700+



4.5 - 8.0



Medium
to Light

Black Seeded

- Early season maturity – 112 days to flowering (Perth)
- Good resistance to phytophthora root rot
- Our improved alternative is Campeda.

TRIKKALA YANNINICUM CLOVER



C or
AgriCote



500 -
750+



5.0 - 8.0



Medium
to Heavy

White Seeded

- Early season maturity – 112 days to flowering (Perth)
- Moderately resistant to clover scorch
- Our improved alternative is Gosse.

WOOGENELLUP SUBTERRANEUM CLOVER



C or
AgriCote



525 -
700+



4.5 - 7.0



Most Soil
Types

Black Seeded

- Mid season maturity – 130 days to flowering (Perth)
- Susceptible to clover scorch and root rot
- Our improved alternative is Campeda.

CLARE BRACHYCALYCIUM CLOVER



C or
AgriCote



600 -
675+



6.0 - 8.0



Medium
to Heavy

Black Seeded

- Late mid season maturity – 136 days to flowering (Perth)
- Susceptible to clover scorch and phytophthora root rot
- Our more productive alternative is Antas.

PARADANA BALANSA CLOVER



C or
AgriCote



450 -
550+



4.6 - 7.8



Most Soil
Types

Mid Maturing

- Annual regenerating clover
- Mid season maturity – approximately 120 days to flowering
- Tolerates waterlogging and mild soil salinity
- Our improved alternative for higher rainfall areas is Bolta.

TRADED VARIETIES

SHAFTAL PERSIAN CLOVER



C or
AgriCote



600-
800+



6.0 – 8.5



Most Soil
Types

Soft Seeded

- Late season maturity – about 160 days to flowering
- Historically known as Shaftal clover
- Vigorous erect growth but susceptible to rust
- Our improved alternatives are Laser and Lightning.

PROLIFIC PERSIAN CLOVER



C or
AgriCote



Sih 275+
Nih 400+



5.5 – 8.0



Most Soil
Types

Hard Seeded

- Early maturing
- Suited to cereal rotations as an alternative to medic
- Improved alternatives are Nitro Plus and Strathwood.

HYKON ROSE CLOVER



C or
AgriCote



350 -
550+



5.0 - 7.0



Most Soil
Types

Hard Seeded

- Early season clover – approximately 100 days to flowering
- Very hard seeded, vigorous spring growth
- Adapted to low fertility soils, frost tolerant.

PRIMA GLAND CLOVER



C or
AgriCote



Sih 350+
Nih 550+



5.0 - 8.0



Most Soil
Types

White Seeded

- Early maturing – about 100 days to flowering (Perth)
- Excellent regeneration
- Red legged earth mite and blue green aphid tolerant.

PARABINGA BARREL MEDIC



AM or
AgriCote



250 -
350+



5.7 – 8.5



Wide
Range

Early Maturing

- Early maturing – 88 days to flowering (Perth)
- Very high levels of hard seed
- Possible replacement – Toreador.

TRADED VARIETIES

PARAGGIO BARREL MEDIC



B or
AgriCote



350 -
450+



>5.7



Heavier
Textured

Mid Maturing

- Mid maturing – 98 days to flowering (Perth)
- Adaptable variety with good early vigour
- Our improved alternative is Jester.

KELSON SNAIL MEDIC



AM or
AgriCote



400+ mm



5.7 – 8.5



Most Soil
Types

Early-Mid Maturing

- Early to mid season maturity
- Suited to hay production
- Can be grown in mediterranean or sub-tropical climates.

NAMOI WOOLLY POD VETCH



E or
AgriCote



400 -
650+



5.0 – 8.0



Most Soil
Types

Hard Seeded

- Mid maturing self regenerating annual
- Indeterminate flowering
- Suitable for grazing, hay and green manure
- Outclassed by Capello.

BLANCHEFLEUR COMMON VETCH



E or
AgriCote



350 -
650+



5.0 – 8.0



Most Soil
Types

Hard Seeded

- Mid maturity variety
- Low hard seed levels
- Suitable for grain, hay or green manure
- Outclassed by Rasina.

POPANY PURPLE VETCH



E or
AgriCote



450 -
600+



5.0 – 8.0



Wide
Range

Soft Seeding

- Late maturing variety
- Suitable for grazing, hay or green manure
- Mostly grown as a mixture with cereals.

TRADED VARIETIES

BARLOO PURPLE VETCH



E or
AgriCote



300 -
450+



5.0 - 8.0



Most Soil
Types

Soft Seeded

- Early maturing popany type
- Soft seeded
- Suitable for grazing, hay or green manure.

Traded Lucerne

Dormancy 5 | Semi Winter Active

HUNTER RIVER LUCERNE



AL or
AgriCote



325 -
400+



5.5 - 8.0



Deep
Well
Drained

- Dormancy rating of 5
- Susceptible to phytophthora root rot and anthracnose
- Our improved alternative is SARDI-Grazer.

Dormancy 6 | Semi Winter Active

AURORA LUCERNE



AL or
AgriCote



350+mm



5.5 - 8.0



Deep
Well
Drained

- Semi winter active with a dormancy rating of 6
- General purpose cultivar suited to dryland and irrigation
- Alternative to Hunterfield and Trifecta
- Outclassed by Genesis II and SARDI-Grazer.

Dormancy 6 | Semi Winter Active

HUNTERFIELD LUCERNE



AL or
AgriCote



325 -
400+



5.5 - 8.0



Deep
Well
Drained

- Dormancy rating of 6
- A selection from Hunter River with aphid resistance
- Our improved alternatives are SARDI 7 Series 2 and Genesis II.

Dormancy 7 | Winter Active

TRIFECTA LUCERNE



AL or
AgriCote



375+mm



5.5 - 8.0



Deep
Well
Drained

- Dormancy rating of 7
- Only moderately resistant to phytophthora root rot
- Outclassed by SARDI 7 Series 2 and Genesis II.

TRADED VARIETIES

SIRIVER LUCERNE

Dormancy 9 | Highly Winter Active



AL or AgriCote



350+mm



5.5 – 8.0



Deep Well Drained

- Highly winter active with a dormancy rating of 9
- Suitable for hay production under irrigation and rotational grazing
- Derived from Hunter River and CUF101
- Outclassed by Pegasis and SARDI 10 Series 2.

SEQUEL LUCERNE

Dormancy 9 | Highly Winter Active



AL or AgriCote



375 - 480+



5.5 – 8.0



Deep Well Drained

- Susceptible to stem nematode and bacterial wilt
- Shows high susceptibility to winter leaf diseases
- Our improved alternative is SARDI 10 Series 2.

Traded Forage Brassicas

RANGI FORAGE RAPE



450+mm



5.5 – 8.0



Most Soil Types

- Remains adequate for some low-intensity applications
- Suits tough conditions
- Susceptible to mildew and generally outclassed by improved cultivars.

MAMMOTH PURPLE TOP (MPT) FORAGE TURNIP



550+mm



5.5 – 8.0



Most Soil Types

- 'Keeper' type with reliable performance, suits all stock classes
- 14-16 week maturity
- Good for summer planting, late autumn grazing.

Traded Forage Cereals

SAIA FORAGE OAT



350+mm



5.0 – 8.0



Most Soil Types

- Early sown forage/hay option
- Fine stemmed tall variety
- Grows in wide range of soil types.

TRADED VARIETIES

SWAN FORAGE OAT

- Dual purpose oat
- Good grain quality
- Can be grazed if season allows.



350+mm 5.0 – 8.0 Most Soil Types

WINTAROO* FORAGE OAT

- High yielding, high quality hay oat
- Tall, mid season variety replacing Marloo
- Resistant and tolerant to CCN.



350+mm 5.0 – 8.0 Most Soil Types

*PBR protected – Product sold under licence from AEXCO.

SHIROHIE FORAGE MILLET

- Fast growing, high yielding forage
- Good rebound from grazing
- Easy grazing management (no prussic acid)
- Sow when soil temp stabilises at 14°C or above.



350+mm 5.0 – 8.0 Most Soil Types

Other Traded Varieties

YARRAN OATS

- Older style dual-purpose variety
- Useful for grazing and fodder production
- Suits later planting or early finishing areas.

EURABBIE OATS

- Versatile dual-purpose oat
- Good recovery after grazing
- Suits earlier planting/late finishing.

MORGAN FIELD PEAS

- Late season variety
- Semi-leafless, high yield dun type
- Suits long-season areas
- Very useful for fodder production for early planting/late areas.

PBR protected: Licensed to Hart Bros Seed Pty Ltd

PBA PERCY FIELD PEAS

- Mid-late season variety
- Conventional, high yield dun type
- Resistant to bacterial blight
- Very useful for fodder production for later planting/earlier areas.

PBR protected: Licensed to Seed Net.

TURF AND LAWNS



Turf and Lawns

Amenity, aesthetics and leisure are a vital part of the structure and tempo of our world. Heritage Seeds has an unsurpassed range of turf solutions for robust sporting activities, landscaping and pleasure pursuits. Many turf options are also crucial to support horticultural activities or to provide a good option for open spaces instead of pavement or bitumen. The backyard is an Australian institution, and there are few better ways to spend casual time than on a nicely grassed home lawn, whether in peaceful solitude or with friends and family.

Lawn seed is a prime example of “you get what you pay for”. Cheaper options often contain components which can have lower germination and a poor outcome. All Heritage Seeds turf mixes have a minimum of 85% germination rates. Select the appropriate Heritage Seeds turf blend for your situation, or get in touch to develop a customised solution.

Starting a New Lawn

Getting a new lawn right is very satisfying. It should not be taken on lightly however, and there are some important things to consider and do to help ensure best results. Spring and autumn are ideal times to plant lawn seed as there is usually adequate moisture and warm temperatures. Avoid very cold and hot dry months particularly if water restrictions are in place as germinating lawn seed must not be allowed to dry out. Sow seed at the rate recommended on the container.

Ten Steps to a Fine Lawn

1. Cultivate and Spray

Eliminate weeds and cultivate. Either cultivate first to a depth of 100-150mm, or spray out the existing cover with a glyphosate based herbicide. Remove any lumps, rocks, rubbish and plant material.

2. Fix Soil Problems

Sandy soil may require organic matter and clay soil gypsum. A simple pH test should be performed. Top soil should be in the range 6.0 - 7.5 pH. Acidic soils may require an application of lime.

3. Level Surface

Make the surface as even as possible avoiding humps and hollows where water will sit. Use a board, smudge or other suitable levelling device. (It is advisable to install watering and or drainage systems at this stage.)

4. Weed Seeds

Water if needed and allow 10-14 days for a fresh germination of weeds. Cultivate again or spray the weeds once more.

5. Good Seed Bed

Use a light roller to create a firm soil base, then rake the surface lightly to make a good seed bed, so that there is enough loose soil to evenly cover the seed.

6. Seed Sowing

Seed should be broadcast on the surface and then raked lightly into the soil providing good seed to soil contact. A lawn starter fertiliser may be incorporated at this time. Keep some seed in reserve to patch up any areas that were missed or are damaged while the lawn is establishing.

7. Watering

Keep the seed bed moist to help even and reliable germination. Once the lawn has started to grow, water daily and then reduce watering as the lawn becomes established. It is better to water deeply once or twice a week to encourage deeper root growth. Do not water in the heat of the day and avoid night watering as this may encourage fungal diseases. Check with your council's regulations regarding establishment and watering of lawns.

8. Mowing

For new lawns mow when the grass is 8-10cm high taking off only the top 1/3 of the plant, as young grass can be damaged by close mowing. Do not mow when the grass and ground is damp and be careful not to drag the mower around corners as this can pull out young plants. For established lawns, no more than one third of the leaf should be removed each time. Increasing the mower height can allow the root system of the grass to develop and maintain grass density.

9. Weed Control

Weeds can be unsightly and compete with the new or established lawn. Depending on the weeds present, there are a number of preparations available for most situations. Consult an advisor on the best way to proceed and carefully follow directions on herbicide labels. For new lawns, weed control should generally be performed after the third mowing. In existing lawns, weed spraying is usually conducted in autumn, winter or spring.

10. Fertiliser

A good time to fertilise is generally before a period of good rainfall in autumn and spring, however it is best to follow the instructions from the fertiliser supplier. Usually a complete NPK fertiliser will be required. Use accurate spreading equipment as over-fertilising can lead to unsightly patches.

Curator Turf and Lawn Blends

The most important decision when establishment turf is choosing the correct variety or mix. However, it is not always easy selecting the right seed blend that suits your situation and the desired outcome. For example, some are sold as 'patch kits' and are designed on high annual ryegrass content and may not persist as turf. An unsuitable variety or mix quality will lead to inferior turf and costly renovations. A few basic things to consider as part of your decision making process:

- Suitability to climatic region
- Quality of varieties
- Time of year when sowing
- Drought tolerance/water use
- Irrigation setup
- Wear tolerance
- Germination time
- Maintenance
- Shade.

Heritage Seeds' Curator turf and lawn range has been specifically designed to suit variations in the Australian climate. Each blend has been developed to meet specific purposes including home lawns, shaded and drought affected areas, nature strips, landscaped regions, sports fields and soil erosion control. Each mix contains high quality seed with a minimum of 85% germination rates, providing the assurance you're receiving the highest genetic and physical quality. For fast establishment, starter fertiliser has also been added.

The Curator range is available in 25kg and 5kg pack sizes for convenience.

HARDWEARING BLEND

CURATOR QUALITY TURF

A tough blend designed to last under harsh weather conditions and rugged use. Hardwearing germinates and establishes quickly without compromising the wear resistance and turf quality. Contains starter fertiliser.

SPECIES	%
Perennial ryegrass	86
Chewings fescue	5
Kentucky bluegrass	5
Highland bentgrass	4
Sow at 3-4kg /100m ²	

SUN AND SHADE

CURATOR QUALITY TURF

A blend selected for shade tolerance where other varieties may struggle. Produces a fine, low growing lawn that has a dense sward with dark green colour. It is also suitable for sunny areas. Contains starter fertiliser.

SPECIES	%
Turf type ryegrass	50
Chewings fescue	50
Sow at 3-4kg /100m ²	

TURF BLEND

CURATOR QUALITY TURF

A dark green, deep rooted and disease tolerant mix. It exhibits excellent wear tolerance and suits most soil types. Ideal choice for home lawns. Contains starter fertiliser.

SPECIES	%
Turf type tall fescue	90
Kentucky bluegrass	10
Sow at 3-4kg /100m ²	

TURF AND LAWNS

PARKS BLEND

GURATOR QUALITY TURF

A durable blend for fine leaf lawns/turf producing a fast establishing, quality turf surface. Contains starter fertiliser.

SPECIES	%
Turf type ryegrass	90
Chewings fescue	5
Kentucky bluegrass	5
Sow at 3-4kg /100m ²	

SUPER-TUFF KIKUYU

GURATOR QUALITY TURF

Super-Tuff Kikuyu is an economical blend of turf Kikuyu with the added benefits of a companion grass. This dual action blend offers the homeowner fast establishment of ryegrass plus the long-term persistence and water-saving features of Kikuyu. As the summer progresses the Kikuyu will begin to dominate the ryegrass. Contains starter fertiliser.

SPECIES	%
Perennial ryegrass	75
Kikuyu	25
Sow at 3-4kg /100m ²	

SUPER-TUFF COUCH

GURATOR QUALITY TURF

Super-Tuff Couch is an economical blend of couch (Bermudagrass) with the added benefits of a companion grass. This dual action blend offers the homeowner or turf manager the fast establishment of ryegrass plus the long-term persistence, water-saving and fine textured features of couch. Contains starter fertiliser.

SPECIES	%
Perennial ryegrass	75
AgriCote couch (Bermudagrass)	25
Sow at 3-4kg /100m ²	

VILLAGE GREEN

CURATOR QUALITY TURF

Village Green is a rapid establishing, hard wearing, economical all purpose blend. It is suited to all lawns, nature strips, park lands and for general erosion control. It combines the ease of establishment with management, to make an all purpose blend for any season.

SPECIES	%
Perennial ryegrass	50
Annual ryegrass	45
Creeping red fescue	2
Kentucky bluegrass	2
Bentgrass	1
Sow at 3-4kg /100m ²	

FINE FESCUE TRUFFLE MIX

CURATOR QUALITY TURF

This blend contains 100% fine fescues and has been designed for low growing, low maintenance areas. With its short stature and shade tolerance, it is suitable for sites that require minimal inputs, and reduced mowing frequency such as trufferies, some orchard groves and vineyard situations, cemeteries and grass airstrips.

SPECIES	%
Creeping red fescue	40
Chewings fescue	30
Sheeps or hard fescue	30
Sow at 1.5-2.5kg /100m ²	

SPORTSFIELD

CURATOR QUALITY TURF

This blend has been designed specifically for use on sportsfields. This fine leaf ryegrass blend has fast germination complemented with high wear and recovery characteristics. It can be used for permanent cool season grounds or to oversow couch fields for winter wear.

SPECIES	%
Continental turf type ryegrass	70
Intermediate turf ryegrass	30
Sow at 3-4kg /100m ²	

TURF AND LAWNS

PLANTATION INTER-ROW BLEND

CURATOR QUALITY TURF

Curator Plantation Blend is a winter active, semi summer dormant inter-row blend. It is specifically designed for plantation seeding including vineyards and orchards. It has winter growth and recovery providing wear tolerance for plantation machinery. Extreme drought tolerance provides a long term stand that won't require reseeding.

SPECIES	%
Prosper winter active tall fescue	60
Rohan SPR ryegrass	20
Turf type tall fescue	20
Sow at 0.5-1.5kg /100m ²	

INTER-LOW MOW BLEND

CURATOR QUALITY TURF

Curator Inter-Low Mow is ideal for situations requiring minimal maintenance. This blend has improved drought tolerance and lower mowing requirements, making it perfectly suited to berry farms, vineyard interrows, cemeteries and industrial or estate situations that require infrequent maintenance once established.

SPECIES	%
Barrobusto turf tall fescue	80
Chewings fescue	10
Hard fescue	10
Sow at 1.5-2.5kg /100m ²	



C4 REHAB

CURATOR QUALITY TURF

C4 Rehab is a combination of drought tolerant AgriCote Bermudagrass and, dependent on season, includes millet (summer) or ryegrass (winter) for seasonal rehabilitation. The C4 Rehab Blend is designed to provide long term Bermudagrass cover and short term protection/erosion control with the inclusion of millet or ryegrass. A multi-purpose blend for use in reclamation and roadside/open space situations.

Winter

SPECIES	%
Millet	50
AgriCote couch (Bermudagrass)	50

Summer

SPECIES	%
Perennial ryegrass	50
AgriCote couch (Bermudagrass)	50
Both seasonal varieties sow at 1-3 kg /100m ²	

C4 LAWN

CURATOR QUALITY TURF

C4 Lawn is a combination of drought tolerant AgriCote Bermudagrass and quick establishing ryegrass for autumn/winter applications. C4 Lawn is designed to provide long term Bermudagrass cover, providing fast establishing dark green winter cover with the inclusion of turf perennial ryegrass. Suitable for lawn mixes during the autumn/winter period.

SPECIES	%
Turf type ryegrass	50
AgriCote couch (Bermudagrass)	50
Sow at 1-3kg /100m ²	



TURF AND LAWNS

Turf Grass Species

PERENNIAL RYEGRASS

Lolium perenne

- Rapid establishment
- Wear tolerant
- Excellent for over-sowing
- Cool-season active.

TALL FESCUE

Festuca arundinacea

- Deep root system
- Hard wearing
- Dark green colour
- Dry tolerant.

CREEPING RED FESCUE

Festuca rubra L.

- Competitive once established
- Low-growing, lateral habit
- Fine texture, dark green
- Dry tolerant.

CHEWINGS FESCUE

Festuca rubra, ssp commutata

- Tolerates close mowing
- Dense growth habit
- Dry and shade tolerant
- Good companion in fine lawns.

HARD AND SHEEP'S FESCUE

Festuca ovina

- Slower growing, low maintenance grass
- Very fine texture
- Low growth habit
- Good shade, heat and dry tolerance.

KENTUCKY BLUEGRASS

Poa pratensis

- Slower establishing cool-season grass
- Striking blue-green colour
- High level of wear tolerance
- Strongly rhizomatous.

COMMON BENTGRASS (BROWNTOP, HIGHLAND BENT)

Agrostis capillaris, *A. Castellana*

- Fine texture, dense habit
- Withstands close mowing
- Medium-dark green
- Reasonable drought, heat and wet-period tolerance.

CREEPING BENTGRASS

Agrostis stolonifera, *A. palustris*

- Densely tillered, spread by stolons
- Withstands very close mowing
- Medium-dark green
- Good wear tolerance.

COUCH GRASS (BERMUDA GRASS)

Cynodon dactylon, *C. transvaalensis*

- Warm-season active
- Forms compact, dense turf
- Withstands close mowing
- Good wear tolerance.

KIKUYU GRASS

Pennisetium clandestinum

- Warm-season active
- Aggressive spreading tough grass
- Dark green with nitrogen in summer
- May go dormant (off-colour) during winter.

TURF AND LAWNS

Cool Season Turf Grasses

	Perennial Ryegrass	Turf Tall Fescue	Creeping Red Fescue	Chewings Fescue	Hard and Sheep's Fescue	Kentucky Bluegrass
Features						
Cool-season growth	Very suitable	Very suitable	Suitable	Suitable	Suitable	Suitable
Warm season active	Suitable	Suitable	Suitable	Suitable	Suitable	Suitable
Dry tolerance	Suitable	Suitable	Suitable	Suitable	Suitable	Usually unsuitable
Frost tolerance	Very suitable	Very suitable	Very suitable	Very suitable	Very suitable	Very suitable
Close mowing <40mm	Very suitable	Suitable	Very suitable	Very suitable	Very suitable	Very suitable
Wear tolerance	Very suitable	Suitable	Suitable	Suitable	Suitable	Suitable
Shade tolerance	Very suitable	Suitable	Very suitable	Very suitable	Very suitable	Suitable

Colour	Perennial Ryegrass	Turf Tall Fescue	Creeping Red Fescue	Chewings Fescue	Hard and Sheep's Fescue	Kentucky Bluegrass
	med-dark	dark green	med-dark	med-dark	med-dark	blue-green

Uses	Perennial Ryegrass	Turf Tall Fescue	Creeping Red Fescue	Chewings Fescue	Hard and Sheep's Fescue	Kentucky Bluegrass
Home lawn/nature strip	Very suitable	Very suitable	Very suitable	Very suitable	Suitable	Very suitable
Parks and gardens	Very suitable	Very suitable	Suitable	Suitable	Suitable	Suitable
Sports ovals	Very suitable	Suitable	Suitable	Usually unsuitable	Usually unsuitable	Suitable
Cricket pitch	Very suitable	n/a	n/a	n/a	n/a	n/a
Tennis lawn	Very suitable	n/a	Very suitable	Very suitable	Suitable	n/a
Greens	n/a	n/a	Very suitable	Very suitable	Usually unsuitable	n/a
Golf tees	Very suitable	n/a	Very suitable	Very suitable	Suitable	Suitable
Golf fairways	Very suitable	n/a	Very suitable	Very suitable	Very suitable	Suitable
Golf roughs	Very suitable	Suitable	Very suitable	Very suitable	Very suitable	Usually unsuitable
Stabilisation	Very suitable	Suitable	Suitable	Suitable	Suitable	Suitable

Sowing rates (kg/100 sq m)						
Singlestand	3.0 - 5.0	3.0 - 4.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	1.0 - 2.0
In a mix	1.5 - 3.0	2.0 - 3.0	1.0 - 2.0	1.0 - 2.0	1.0 - 2.0	0.25 - 0.5
Oversowing existing sward	1.5 - 3.0	2.0 - 3.0	1.5 - 3.0	1.5 - 3.0	1.5 - 3.0	n/a
Oversowing Kikuyu/couch	3.0 - 4.0	n/a	1.0 - 2.0	1.0 - 2.0	1.0 - 2.0	n/a

Key:		Very suitable		Usually unsuitable
		Suitable		Not advisable

TURF AND LAWNS

Common Bentgrass
(Browntop-Highland Bent)

Creeping Bentgrass



med-
dark

med-
dark



0.7 - 1.0	0.5 - 1.0
0.1 - 0.5	0.1 - 0.5
0.1 - 0.5	0.1 - 0.5
n/a	n/a




TURF AND LAWN

Curator Quality Turf Mixes

	Curator Hardwearing	Village Green	Curator Sportsfield	Curator Sun and Shade	Curator Parks	Curator Turf Blend
Features						
Cool-season growth	Very suitable	Very suitable	Very suitable	Very suitable	Very suitable	Very suitable
Warm season active	Suitable	Suitable	Suitable	Suitable	Suitable	Suitable
Dry tolerance	Suitable	Suitable	Suitable	Suitable	Suitable	Suitable
Frost tolerance	Very suitable	Very suitable	Very suitable	Very suitable	Very suitable	Very suitable
Close mowing <40mm	Very suitable	Very suitable	Very suitable	Very suitable	Very suitable	Suitable
Wear tolerance	Very suitable	Very suitable	Very suitable	Very suitable	Very suitable	Suitable
Shade tolerance	Very suitable	Very suitable	Suitable	Very suitable	Very suitable	Suitable
Colour	mid green	mid green	mid green	dark green	dark green	dark green

Uses	Curator Hardwearing	Village Green	Curator Sportsfield	Curator Sun and Shade	Curator Parks	Curator Turf Blend
Home lawn/nature strip	Very suitable	Very suitable	Very suitable	Very suitable	Very suitable	Very suitable
Parks and gardens	Very suitable	Very suitable	Suitable	Very suitable	Very suitable	Very suitable
Sports ovals	Very suitable	Suitable	Very suitable	Suitable	Very suitable	Suitable
Cricket pitch	-	n/a	-	-	Suitable	-
Tennis lawn	-	n/a	n/a	Very suitable	Suitable	-
Greens	n/a	n/a	n/a	n/a	n/a	n/a
Golf tees	Suitable	Suitable	Suitable	Suitable	Suitable	-
Golf fairways	-	-	Usually unsuitable	Suitable	Suitable	-
Golf roughs	Very suitable	-	Usually unsuitable	Suitable	Suitable	Suitable
Stabilisation	Very suitable	Very suitable	Very suitable	Suitable	Suitable	Suitable

Sowing rates (kg/100 sq m)						
Singlestand	3.0 - 4.0	3.0 - 4.0	3.0 - 4.0	3.0 - 4.0	3.0 - 4.0	3.0 - 4.0
In a mix	-	-	-	-	-	-
Oversowing existing sward	2.0- 3.0	2.0- 3.0	2.0- 3.0	2.0- 3.0	2.0- 3.0	2.0- 3.0
Oversowing Kikuyu/couch	2.0- 3.0	2.0- 3.0	2.0- 3.0	2.0- 3.0	2.0- 3.0	n/a

Key:		Very suitable		Usually unsuitable
		Suitable		Not advisable

TURF AND LAWN

Fine Fescue Blend
(Truffle Mix)

Inter-Low-Mow Blend

Plantation Inter-Row Blend

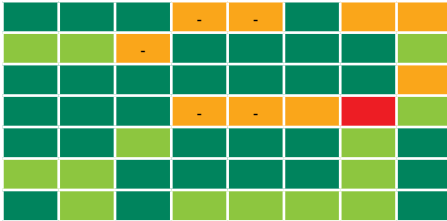
Curator Super Tuff
COUCH

Curator Super Tuff KIKUYU

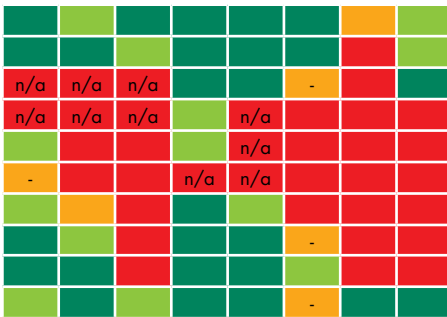
C4 Lawn

C4 Rehab (summer)

C4 Rehab (winter)



med-dark mid-green med-dark mid-green mid-green mid-green mid-green mid-green



2.0-3.0	2.0-3.0	2.0-3.0	2.0-3.0	2.0-3.0	1.0-3.0	1.0-3.1	1.0-3.0
1.0-2.0	1.0-2.0	1.0-2.0	-	-	-	-	-
1.5-3.0	1.5-3.0	1.5-3.0	1.5-2.5	1.5-2.5	1.0-2.0	1.0-2.1	1.0-2.0
n/a	1.0-2.0	1.0-2.0	couch only 1.0-2.0	Kikuyu only 1.0-2.0	-	-	-

Seed Coating

Tailored seed coatings are primarily used to enhance seed establishment, the delivery of rhizobia for legume inoculation and to improve handling and ballistics properties for aerial seeding. Heritage Seeds offers a range of seed technology options that have been developed for specific plant species. There are generally two types of coatings available:

- Lime-based coating: typically used for legumes and tropical grasses (resulting in a 'build-up', ie. weight gain of the seed)
- Film-coating: typically used for grasses or field crops to deliver a chemical seed coating (negligible weight gain for the seed).

AgriCote: Heritage Seeds premium seed coating technology AgriCote is available for pasture legumes, tropical grasses and forage herb species. It is designed to deliver significant advantages to plant establishment through insect protection (Gaucho®), fungicide protection, inoculant bacteria (on most legumes) and micro-nutrients. This coating technology also significantly improves the handling aspects of some seeds, enabling more efficient distribution across the paddock, which is particularly important for aerial application of some tropical species. For more information about AgriCote refer to page 154.

Gaucho Film Coat: A film-coat of Gaucho insecticide is designed to protect seedlings from biting and sucking insects (including red-legged earth mites) for up to four weeks during establishment. Gaucho Film Coat offers 'stress shield' benefits, which help to protect treated plants during extended dry periods. Gaucho Film Coat also includes a fungicide which protects the seed against fungal diseases.

Poncho Film Coat: Poncho Plus insecticide is designed to protect seedlings from chewing as well as biting and sucking insects for up to four weeks during establishment. It includes the active ingredient in Gaucho Film Coat offers 'stress shield' benefits, which help to protect treated plants during extended dry periods. Poncho Film Coat also includes a fungicide which protects the seed against fungal diseases.

SEED TECHNOLOGY AND GENERAL INFORMATION

OptiCote: offers both fungicide and insecticide protection for sorghum and corn crops. A film coating of Vitavax® and Gaucho is used on corn. Thiram and Gaucho/Cruiser® are used for sorghum.

OptiCote PLUS: consists of the ingredients of OptiCote as mentioned above, but also includes Concept II® seed safener, for the use of Dual Gold herbicide in sorghum.

@Concept II, Cruiser and Dual Gold are registered trademarks of Syngenta.

@Gaucho, Poncho Plus are registered trademarks of Bayer.

@Vitavax is a registered trademark of Crompton.



Untreated vs Treated

SEED TECHNOLOGY AND GENERAL INFORMATION

	SEED COATING	SEED BUILD	CHEWING INSECTS
Temperate Grasses	Gaicho Film Coat	No Build	
Temperate Grasses	Poncho Film Coat	No Build	✓
Temperate Legumes	AgriCote	Yes	
Forage Brassicas	Poncho Film Coat	No Build	✓
Forage Herbs	AgriCote	Yes	
Lucerne	AgriCote	Yes	
Tropical Grasses	AgriCote	Yes	
Tropical Legumes	AgriCote	Yes	
Corn / Maize	OptiCote	No Build	
Grain Sorghum	OptiCote	No Build	
Grain Sorghum	OptiCote Plus	No Build	

SEED TECHNOLOGY AND GENERAL INFORMATION

BITING / SUCKING INSECTS	FUNGICIDE	TRACE ELEMENTS	RHIZOBIA	STRESS SHIELD	LIME
✓	✓			✓	
✓	✓			✓	
✓	✓	✓	✓	✓	✓
✓	✓			✓	
✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓
✓	✓				
✓	✓				
✓	✓			Plus Concept II® Seed Safener	

AgriCote®

Tailored Seed Enhancement

AgriCote is designed to enhance seedling establishment by delivering improved early seedling vigour and root development through the inclusion of growth promotants and dormancy breaking technologies. It includes nutrients designed to be immediately available to the seedling and provides protection against fungal diseases through a fungicide treatment. AgriCote also includes insecticidal treatments that offer protection from biting and sucking insects. In addition to all of these state-of-the-art elements, AgriCote also features encapsulated rhizobia which prolongs shelf life of treated legumes and helps to ensure good legume nodulation in the paddock, maximising your investment.

Potential benefits include:

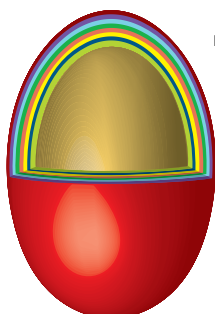
- Dormancy breaking technology which is not available in any other seed coat
- Improved plant establishment
- Improved early root growth and development
- NPK nutrients and trace elements that are immediately available to the seedling
- A more robust seedling for slow establishing grasses
- Encapsulated rhizobia for longer shelf life
- Protection against biting and sucking insects
- Protection against fungal diseases
- Better ballistic properties for flying onto hill country.

AgriCote Seed
typical coating make-up

Lime Coating
creates a favourable
germination environment

Fungicide Protection
option of pythium and
phytophthora protection

Protective Polymer
protects and isolates bacteria



Bonding Polymer
bonding AgriCote seed capsule

**NPKS and
T.E. Nutrients**
immediate rhizobia and
seedling nutrition

Growth Promotant
promotes establishment
and seed vigour

Biological Inoculant
promotes establishment
and seed vigour

SEED TECHNOLOGY AND GENERAL INFORMATION

RHIZOBIUM INOCULATION GROUP	SUITABLE SPECIES	NOTES
AL	Lucerne	
	Strand medic	
	Disc medic	
AM	All other annual medic species	Annual medics except Strand and Disc
B	White clover	Suits most perennial clovers
	Red clover	
	Berseem clover	
	Alsike clover	
	Strawberry clover	
C	Balansa clover	Suits most annual clovers
	Persian clover	
	Arrowleaf clover	
	Sub-clovers - all types	
	Rose clover	
	Crimson clover	
E	Field peas	Group E and Group F can be fully interchanged
	Vetch	
F	Faba beans	Group E and Group F can be fully interchanged
	Lentils	
G	Lupin	Group G and Group S can be interchanged
H	Soy beans	
I	Cowpeas	
	Mungbeans	
J	Pigeon peas	
	Lab Lab	
N	Chickpeas	
S	Serradella	Group S and Group G can be interchanged
SPECIALTY:		
SU343	Birdsfoot trefoil	
WSM1497	Biserrula	
CB1717	Burgundy bean	
CC283b	Caucasian clover	
CB782	Kenya white clover	
CC829	Lotus	
WSM1292	Sulla	

SEED TECHNOLOGY AND GENERAL INFORMATION

Seed Weights

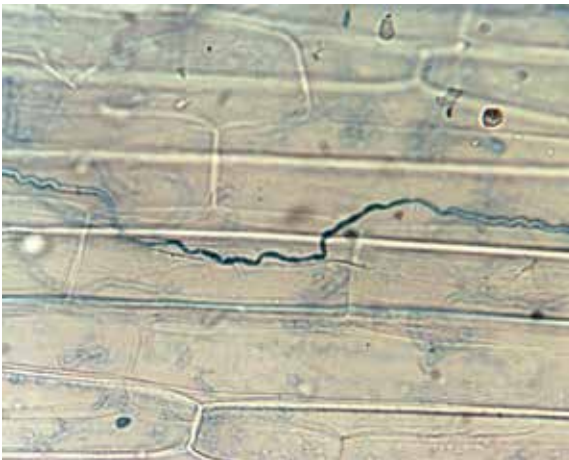
SPECIES	SEEDS/GRAM
Pasture grasses	
Ryegrass - diploid	500 - 600
Ryegrass - tetraploid	250 - 300
Tall fescue	400 - 450
Phalaris	500 - 550
Cocksfoot	1000 - 1100
Brome grasses	100 - 120
Timothy	2500 - 2800
Tall wheat grass	150 - 200
Pasture legumes	
White clover	1500 - 1800
Red clover - diploid	500 - 550
Red clover - tetraploid	300 - 350
Strawberry clover	650 - 700
Balansa clover	870 - 1100
Arrowleaf clover	650 - 750
Berseem clover	440 - 480
Persian clover	750 - 900
Sub-clover	90 - 150
Lucerne	400 - 480
Barrel medic	230 - 300
Burr medic	230 - 300
Other forages	
Chicory	600 - 800
Plantain	500
Forage rape	300 - 350
Turnips	200 - 400
Swede	250 - 450
Kale	200
Forage barley	22 - 30
Forage oats	23 - 30
Forage triticale	20 - 25
Forage sorghum	30 - 45
Millet	150 - 200
Common vetch	15 - 25
Woolly pod vetch	20 - 40

Note: Many seed sizes and weights will vary markedly depending on seed growing conditions, seed processing and cultivars.

Endophyte Technology

What is an endophyte?

An endophyte is a fungus that lives naturally in a plant. In the wild and cultivated areas there are many different grasses and endophytes, often they have a special and unique symbiotic relationship with each other. The grass offers the fungus nutrient, a home and a method of multiplication and dispersal. The fungus gives the plant some protection from pests and over-grazing. The fungus also produces chemicals that perform the insecticidal and anti-feeding functions thus helping the plant's survival.



Endophyte under microscope

Animal and productivity effects

In ryegrass, the animal health problems manifest as ryegrass staggers (from the chemical Lolitrem-B) and/or heat stress (Ergovaline). In tall fescue, there are no incidents of staggers, but high levels of ergovaline leading to heat stress and at its worst, a condition called 'fescue foot' where animals have severely restricted blood-flow to the extremities of the body. Naturally occurring ryegrasses and fescues usually have fairly high levels of these chemicals in the plant at certain times of the year, most notably when seed heads are developing in late spring, and in early autumn when coming out of summer dormancy.

SEED TECHNOLOGY AND GENERAL INFORMATION

Endophyte chemicals can cause production losses as well as leading to potential injury or death of the animals. Even if the livestock do not seem to be under the effects of the endophyte, there may be sub-clinical effects that are lowering milk or meat production, without the animals seeming to suffer. Ideally we want the pasture to have the plant-survival characteristics that normal endophyte offers, but without health effects or production losses. In some situations, particularly where animals are being very intensively produced, the staggers and heat stress issues affect the economic performance of the farm to a point where other options should be considered and carefully taken up.

Standard, Nil, Novel

SE, meaning Standard Endophyte (formerly referred to as HE), is the term loosely used for all grasses with a normal, native, natural or wild-type endophyte.

Available are Nil endophyte grasses (<5% endophyte) (also sometimes called WE - Without Endophyte) where the fungus has been allowed to die out in the seed. These offer terrific animal health benefits, but do not have the survival characteristics of SE grasses and, in many cases or environments, Nil endophyte grasses may not be as persistent.

Novel endophytes are selections made to offer some of the benefits to the plant with lower levels of animal health problems. They have been brought to the seed market through a process involving a laboratory technique, by injecting the selected endophyte into nil endophyte plant seedlings, or in the case of NEA2, brought through with the grass breeding program.

Ryegrass

The AR and NEA novel endophytes are selected for nil or very low Lolitrem-B, and nil to moderate ergovaline levels. The peramine levels are kept at natural levels or may in fact be enhanced for the insecticidal effects to be promoted. Ergovaline has some insecticidal properties too, and retaining some of this (NEA2, AR5, AR6) possibly offers better persistence over AR1 in some circumstances. AR37 endophyte operates quite differently, and produces a group of chemicals called janthritems. AR37 grasses have shown reasonably good results for persistence under insect pressure, but may still lead to staggers in some conditions.

SEED TECHNOLOGY AND GENERAL INFORMATION

Tall fescue

Tall fescue naturally hosts an endophyte, however most of the tall fescue pasture seed available since the early 1980s has been offered as nil endophyte. Wild-type tall fescue endophyte typically contains varying levels of ergovaline that may contribute to either heat stress or ergotism in warmer times or to lameness (fescue foot), more commonly seen in late autumn or winter. Horses and cattle appear to be more readily affected than sheep. More recently some novel endophyte varieties have been developed, although are not recommended for animals other than cattle and sheep.

Transfer of endophyte into the field

It should be remembered that in some cases the novel endophytes in grass seeds do not last very well in storage, unless cared for under low temperature and low humidity.

Sensitive seed stock should be stored in positions where it is not subjected to large temperature fluctuations – avoid the high rack on the northern side of the shed for instance. Seed should be carefully stored and stocks regularly turned over.

Heritage Seeds conducts regular testing to ensure that varieties are offered with good levels of novel endophyte in the seed lot.

Sowing a new novel endophyte variety will not necessarily solve all endophyte related problems on the farm. Control of old grass from previous pastures, and care as to where and what is fed out in terms of fodder will also be important. Also remember that soil fertility, pasture management, animal health and feed quality will also need to be well managed, and may in many cases be a more significant issue than what endophytes are present in the pasture.



SEED TECHNOLOGY AND GENERAL INFORMATION

	NEA2, NEA	AR1
	Ideal for good balance of performance and persistence. No animal concerns.	Good fit for much of Australia, horse safe. No animal concerns.

Alkaloid:

Lolitre-B	Low level	No
Ergovaline	Low-med Level	No
Peramine	Yes	Yes
Janthritem	No	No
Loline	No	No

Insect Protection¹:

Argentine Stem Weevil (ASW) Larvae	Moderate - Good ²	Very Good
Argentine Stem Weevil (ASW) Adults	Moderate - Good ³	Very Good
Black Beetle (BB)	Good	Poor
Root Aphid (RA)	Moderate - Good ⁴	Poor
Pasture Mealy Bug	Very Good	Very Good

Animal Performance:

Freedom from ryegrass staggers	Excellent	Excellent
Relative animal performance	Excellent	Excellent

1. Observational information provided for guidance only. Endophyte insecticidal effects in Australia are yet to be fully verified.
2. NEA/NEA2 endophyte expression varies between cultivars. Diploid cultivars appear to have greater resilience to ASW larvae.
3. NEA2, AR1 and SE have similar good levels of tolerance to ASW adults.
4. NEA/NEA2 endophyte expression varies between cultivars. Diploid cultivars appear to have greater resilience to root aphids.
5. Heritage Seeds does not have observational data for AR5 endophyte in Australia.

SEED TECHNOLOGY AND GENERAL INFORMATION

AR5	AR37	WILD TYPE (WT, SE, HE)	NIL
Generally safe; some reports of production decline in lambs	Sheep and cattle only. May cause staggers.	Staggers possible, good persistence, animal performance variable.	Rarely persists for long periods due to lack of insect tolerance.
No	No	High level	No
Low Level	No	High level	No
Yes	No	Yes	No
No	Yes	No	No
No	No	No	No

Good ⁵	Good - Very Good	Very Good	Poor
Good ⁵	In Question ⁶	Very Good	Poor ⁶
Good ⁵	Good	Good	Poor
Moderate ⁵	Very Good	Moderate	Poor
Very Good ⁵	Very Good	Very Good	Poor

Excellent	Staggers in some circumstances ⁸	Staggers often Probable ⁹	Excellent
Very Good - Excellent ⁷	Very Good - Excellent ⁸	Variable ¹⁰	Excellent

6. ASW adults preferentially graze Nil endophyte and AR37 in lab tests.

7. Some reports of slight production decline in lambs grazing AR5.

8. AR37 has led to instances of staggers in sheep. Incidence are probably rarer and less severe than seen in SE.

9. SE types are the regular cause of ryegrass staggers and production losses in Australia.

10. There is some variation in SE endophytes in ryegrasses and their expression.

Ryegrass staggers

In ryegrass, the animal health problems manifest as ryegrass staggers (from the chemical Lolitrem-B) and/or heat stress (Ergovaline). Illness of animals expressed from consuming ryegrass with toxic levels of endophyte is often referred to as Perennial Ryegrass Toxicosis (PRGT).

PRGT can be a serious problem during summer and autumn months. The overwhelming threat is from the syndrome known as ryegrass staggers which can lead to animal losses through ill-thrift and death. These alkaloids can cause production losses as well as leading to potential injury or death of the animals. Even if the livestock do not seem to be under the effects of the endophyte, there may be sub-clinical effects that are lowering milk or meat production, without the animals seeming to suffer. There are also often animal welfare concerns. Heat stress may also be observed, but appears less common in the main. There is no specific treatment for PRGT. Toxic pastures can however be addressed through good management and can often be replaced with safe alternatives.

Avoiding ryegrass staggers:

- Do not use ryegrasses with wild-type endophyte. Other options are readily available
- Plant/over-sow a diverse pasture mix, and manage it to reduce any (toxic) ryegrass component
- Adopt a program to replace staggers-causing paddocks that should include reducing the soil weed-seed burden
- Develop a number of 'staggers-safe' pastures, specifically reserved for the threat period, particularly for younger stock
- Introduce supplementary feeding before the staggers season
- Avoid feeding hay or silage made from wild-endophyte pastures through the staggers season
- Avoid introducing hungry stock to the first ryegrass shoots of the autumn, and offer enough pasture to reduce the grazing pressure, thus reducing the inclination to graze the grass hard in the crown
- Avoid contamination of staggers-free pasture from seed sources such as brought-in hay.

SEED TECHNOLOGY AND GENERAL INFORMATION

If ryegrass staggers occurs:

- Monitor stock during periods of stressed green-pick through summer and autumn
- Quietly move affected animals to safe pastures or confinement areas with shade and water
- Prevent access to dams or waterways to prevent drowning; provide water via troughs
- Avoid using dogs or loud/swift vehicles
- Use of narrow ditches to set sheep upright
- Animals may improve over 1-2 days, although toxins can remain in their system for a week or two.

Other Common Animal Health Issues

Heritage Seeds offers the following information in good faith that it may help to develop strategies and tactics on farm to assist production. Heritage Seeds do not have any claims to be experts in veterinary science. The information here is far from comprehensive, but may prove a useful starting point to provide the reader with some considerations when developing your plans. If topics relating to management of ill livestock are of interest or importance, seek further information from animal health specialists.



COMMON ANIMAL HEALTH ISSUES FROM PASTURES AND FORAGE CROPS

ISSUE	TYPICAL SIGNS / SITUATIONS	USEFUL RESPONSES AND MANAGEMENT OPTIONS
Acidosis/Laminitis /Founder/Grain poisoning	High sugar levels and low rumen pH from excessive grains, high sugar forages. Often combination of crushed grain and lush feed. Signs: loss of appetite, listlessness, dehydration, scouring, blindness, spasm, death.	Remove crushed grains. Feed additives such as Bentonite, lime-stone and bicarb soda drench. Introduce concentrates slowly and monitor. Avoid high % brassica petiole in diet. Increase fibre to stimulate saliva / cud-chewing.
Annual ryegrass toxicity (ARGT)	Wimmera ryegrass seed head in late spring with slimy exudate from the nematode <i>Anguina funesta</i> in combination with a bacterium. Signs: high stepping gait, nervous convulsions, collapse, death.	Monitor possible paddocks for signs. Gramoxone pasture top in mid spring. Burn affected stubbles. Grass-free pasture phase/crop it out. Avoid buying hay or poorly produced grain from affected areas. Reduce reliance on Wimmera ryegrass. Use certified annual ryegrass seed.
Bloat	Gorging of high legume pastures of red, white, sub-clovers and lucerne, often in wet conditions. Signs: rapid breathing, distended left abdomen, animals appear distressed, eyes bulging, deaths.	Avoid putting empty/hungry animals onto such pastures, or do so only for brief periods and monitor. Increase fibre offer (hay), teric based blocks, bloat capsules, spray bloat oil pre-grazing, oil drenches.
Facial eczema (Mycotoxicosis)	Most common from Feb to May, with lots of plant litter in the pasture. Signs: mild photosensitisation (sun burn) to severe jaundice and death.	Move stock to longer pasture; avoid paddocks cut for hay or late topped, these can be more toxic due to pasture litter. Introduce zinc in ration. Avoid mouldy hay/silage. Test feed grains for mycotoxins.
Ergotism/Heat stress/Fescue foot (a mycotoxicosis)	Infected seed in pastures or hay etc, often paspalum, but many species of grass included. Uncharacteristic panting and seeking shade/water-holes in hot weather. Reduced weight-gain/milk. Fescue with wild endophyte in cold seasons, esp. horses, cattle develop lameness (fescue foot). Low conception rates, muscle tremors, incoordination or foot gangrene and death in severe cases. From wild endophyte in ryegrass or fescue.	Remove stock to safer pastures, do not offer feed from infected summer pastures or pasture hay from such sources. Avoid set-stocking suspect fescue dominant pastures in colder months. Introduce new species or renew pastures with "safe" endophyte options.

COMMON ANIMAL HEALTH ISSUES FROM PASTURES AND FORAGE CROPS

Hypocalcaemia /Milk fever	Late pregnancy and early lactation. Signs: proppy gait, bellowing, muscle spasms, tremors, staggers, convulsions, sudden death.	Feeding hay with ground lime-stone, quality clover and lucerne hay is good. Calcium/magnesium blocks. Intravenous drips. Avoid cereal hay, grains, sorrel, kikuyu. Give shelter in cold weather.
Hypomagnesemia /Grass tetany	Low magnesium levels often on winter grazed cereals. Signs: proppy gait, bellowing, muscle spasms, tremors, staggers, convulsions, sudden death.	Feeding hay with causmag, quality clover hay is good. Mg bullets, and licks/grass tetany blocks, lower K fertiliser levels in autumn. Magnesium injections.
Lupinosis (Mycotoxiosis)	Sheep feeding on lupin stubbles in damp summer. Jaundice, photosensitivity, weak animals evident in the mob.	Monitor stock on lupin stubble paddocks when summer rains are about.
Nitrate poisoning	High N in feed: ryegrasses, cereals, maize, brassicas. Nitrate levels too high in rumen: high respiration rate, gasping, convulsions, and death. Blood is typically brown. Can cause abortion.	Nitrate levels in feed <10g/kg DM to be safe. Monitor stock on lush green feed or Group I sprayed weed-dominant sites. Grazing management and moderate use of N fert are the main things.
Phalaris staggers	Occurs after a longer grazing period, mainly in cobalt deficient areas in autumn. Animals stagger, head nodding, obviously bad gait, collapse, rapid heartbeat, nervous tremors, death.	Avoid temptation to put hungry sheep on first green pick in autumn. Use sentinel sheep and monitor. Use of cobalt supplements orally. Remove sheep from affected pastures, some affected ones may recover - can take up to a week. Alternate feeds.
Phalaris sudden death	Often within a few hours of being introduced to phalaris pastures. Breathing problems, blue gums, rapid heartbeat and often death.	As for phalaris staggers, but cobalt has no effect.
Phytosensitivity	Grazing brassicas too early. Avoid too high percentage in the diet. Redness and swelling on exposed areas: blistering of ears and face. Liver damage and unable to process plant toxins and over-load of chlorophyll.	Remove stock and find shade, monitor grazing of brassicas - reduce percentage of brassica in diet/eat bulbs/stem as well as leaves (break-fence). Avoid weeds like Patersons' curse, ragwort, storksbill.

COMMON ANIMAL HEALTH ISSUES FROM PASTURES AND FORAGE CROPS

ISSUE	TYPICAL SIGNS / SITUATIONS	USEFUL RESPONSES AND MANAGEMENT OPTIONS
Phyto-oestrogens	Common in the older types of red clovers, sub-clover pastures, sometimes in lucerne (often 80% + legume pastures of this nature). Maybe 10-20% failure to join. Increased birthing problems.	Pasture selection during flushing/joining periods and pregnancy. Manipulate balance of pasture swards: sprays, over-sowing, grazing management.
Prussic acid (Hydro cyanic poisoning)	Typically relates to grazing of immature, droughted or frosted forage sorghum. Any stress on it including herbicides will increase to HCN. Muscle trembling, staggers, gasping, collapse, coma, death.	Affected stock should be removed and treated with sodium thiosulphate. Do not graze immature or stressed crops. Do not introduce hungry/empty stock. Provide sulphur lick blocks. Use low prussic acid varieties.
Pulpy kidney (enterotoxaemia)	A clostridial disease. Poor movement of food through the gut causing a build-up toxin in the intestine. Sudden death with or without convulsions.	Vaccination at key times. Provide hay/silage and grazing management when going on to lush feed.
Red gut	Grazing lush legumes, esp. lucerne, occasionally on other quality pasture/forages. Signs: intense reddening of the intestine and sudden death.	Remove animals from lucerne or fodder crop. Offer hay or silage. Grazing management: on-off cycle and monitor feed.
Red water	High sulphur levels in brassicas, immature crops, seed heads on canola crops and other brassicas going to seed. Animal urine turns/runs red.	Remove stock and wait for brassica to mature. On-off grazing management. Reduce fertiliser S in programs.
Vetch seed	Toxicity from grazing stubbles where vetch grain has been produced or consumption of hay cut after pod-fill.	Avoid grazing stubbles from vetch seed production. Monitor hay production. Can be fatal to most forms of livestock.

COMMON ANIMAL HEALTH ISSUES FROM PASTURES AND FORAGE CROPS



Seed Certification

The Australian Seeds Authority (ASA) is responsible for controlling seed certification in Australia. Seed certification protects the identity of a cultivar and provides the assurance that you can buy seed that is as close as possible to the genetics of the variety originally selected by the breeder. Operated under protocols from the International Seed Testing Authority (ISTA), seed laboratories, staff and paddock inspectors are qualified and authorised under strict guidelines.

A crop is required to be grown to specific standards. For example, to grow Bealey ryegrass, the paddock needs to be free from any other ryegrass varieties for at least the two previous seasons. This eliminates risk of contamination. Before harvest, the crop is required to pass an in-field inspection by an authorised third party. After harvest, cleaning and packaging, the resultant seed is tested by the authorised laboratory and needs to be of sufficient purity. For example, perennial ryegrass of first generation is required to be a minimum of 98% pure seed and a maximum 0.7% other seed. Full guidelines for certification requirements are available at www.seedtesting.com.au

All certified Heritage Seeds' seed will have certification tags attached to the sacks. Certification certificates are available on request.

Seed analysis certificate

A seed analysis certificate documents the quality of a seed line and if it has been laboratory tested in a standard way. All seed has its own line number which is printed on the side of the seed sack, with each line having its own analysis certificate.

Specific certificates may also be issued for some other circumstances

SEED TECHNOLOGY AND GENERAL INFORMATION

The certificate will usually show some or all of the following information:

CULTIVAR TESTED	NAME AND OR VARIETY NUMBER DESIGNATION
Species	Botanical name
Seed line number	A unique number that identifies the seed lot, also stamped on the sacks
Date of test	Date sample analysis was completed and reported
Purity	% pure seed, and contaminants including inert matter and/or other seeds
Germination	% live seed: may involve breaking dormancy with KNO ₃ and/or pre-chilling
Normal seedlings	Length of test will depend on seed type, typically assessed at emergence of cotyledons or primary leaf from seed coat or coleoptiles
% first count	(often good enough). A high % can indicate good vigour and vice-versa
% final count	% of normal seedlings after standard germination period
Abnormal seedlings	% slow or obvious distorted: split coleoptiles, missing parts, stunted, etc
Hard seed	As a %: Long term form of dormancy, only applicable to legumes
Fresh un-germinated	As a %: indicates short-term form of dormancy, commonly found in tests close to harvest, often identified with KNO ₃ and/or pre-chilling
Dead seed	As a %: indicated by failure to germinate or decayed/damaged seed
Bulk search	Contaminants in very low levels, not enough to show in purity sample

Some other tests sometimes performed:

Tetrazolium (TZ)	A quick test using stain to identify germinable seed
Vigour testing	Often using conductivity, applicable to legumes, sometimes unreliable
1000 gwt	The weight in grams of 1000 seeds, used for calculating sowing rates
Anguina	Presence of galls from the ART associated nematode <i>Anguina funesta</i>
Endophyte %	In perennial ryegrass (either seed or seedlings grow outs) <ul style="list-style-type: none"> • NEA2, AR1 or AR37 : 70%+ of seed have stated endophyte • LE or 'Low endophyte' : a low level of seeds have any endophyte
ELISA test	For the presence of AR1 endophyte (either seed or seedlings grow outs)
GMO testing	Specific reporting for the detected presence of GM events. Usually only applicable to canola seed entering SA or TAS

NEW VARIETIES

Heritage Seeds' ongoing commitment to research and development continues to be realised in the release of new cultivars. A number of potential new varieties are listed here. Our intention is to continue through evaluation prior to their release to assure their suitability. They offer opportunity to add to the productivity of our customers.

PASTURE LEGUMES:

Lofty	Brachycalycinum sub-clover with improved yield and seed regeneration
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TROPICALS:

Lakota	Buffel grass with improved cold tolerance and broader adaptation.
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MegaMax™049	Panic grass with improved yield and persistence
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FORAGE CEREALS:

Wizard	Forage oat, northern areas
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FIELD CROP:

HM-151	88 CRM corn / forage maize
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HM-152	97 CRM corn / forage maize
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Kowari	Potential milling oat
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Durack	Potential milling oat
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SUPERSEDED/RETIRED VARIETIES

Plant-breeding and evaluation trials continue to bring forth new cultivars with improved characteristics and performance. For convenience, the following table describes recent cultivar changes to our portfolio:

GRASSES:	
Maximus annual ryegrass	replaced by Vortex, p32
T-Rex annual ryegrass	replaced by Vortex, p32
Meridian perennial ryegrass	replaced by Kidman, p25
Grassly cocksfoot	replaced by Safin, p39
Fraydo fescue	replaced by Prosper, p42
Holdfast phalaris	replaced by Holdfast GT, p36
Landmaster phalaris	replaced by Advanced AT, p35
PASTURE LEGUMES:	
Bolta balansa	replaced by Vista, p56
Angel medic	replaced by Sultan-SU, p61
Jester medic	replaced by Sultan-SU, p61
LUCERNE:	
SARDI 5	replaced by SARDI-Grazer, p83
SARDI 7	replaced by SARDI 7 series 2, p84
SARDI 10	replaced by SARDI 10 series 2, p85
Genesis	replaced by Genesis II, p85
Venus	replaced by SARDI-Grazer, p83
TROPICALS:	
B1 Burgundy Bean	replaced by Garnet, Presto, p109
FIELD CROP:	
Galileo	replaced by Mammoth, p102
Gairdner	replaced by GrangeR, p178
RETIRED VARIETIES:	
Blaza	Crimson clover
EGA Bellaroi	Durum wheat
Wyalkatchem	Wheat
Essence	Forage sorghum
Express	Forage sorghum
Silo	Forage sorghum
Stature BMR	Forage sorghum
Australian II	Phalaris
Akkura	Sulla
Dovey	Tall fescue

FIELD CROPS



Heritage Seeds' National Field Crop Business

Heritage Seeds' national field crop business is committed to the coarse grains industry, focusing on the commercialisation of innovative cropping products for Australian growers.

Integral to this work is diversification into new product segments. Growers are constantly seeking new opportunities and it is Heritage Seeds' role to identify, develop and deliver these outcomes. Existing seed varieties are being continually developed to help ensure the ongoing profitability of new varieties.

Field crop production

Production is spread across most states where the seed is marketed and sold. Heritage Seeds' hybridised production model has an excellent group of year-on-year production growers who deliver high quality seed in order to meet the expectations of our business, as well as our Heritage Broadacre Agents (HBAs).

Pioneer Pro-Access program

Through our existing Pioneer Pro-Access program, Heritage Seeds has successfully commercialised an exciting range of new varieties of canola, grain sorghum and grain corn. These products are available through our field crop business and are sold directly by Heritage Seeds. Contact your local territory manager for details.

Research, Development and Extension (R D and E) Program

Through Heritage Seeds' research, development and extension program (R D and E), our team of skilled and experienced agronomists is constantly exploring new opportunities to improve profitability at the farm gate level. Our investment ensures our new cropping cultivars meet all due diligence requirements both in the laboratory and in the field prior to commercial release.

Heritage Seeds has long standing partnerships with a number of breeding organisations both domestically and overseas. We also work in close alliance with end users including millers and maltsters so they are aware of any new product developments.

Research, development and extension are key to a sustainable and profitable future for Australian farming communities. Heritage Seeds is proud to be a major stakeholder in the development and delivery of new and innovative products to satisfy the needs in a challenging and changing environment.



Canola

BANKER CL

CANOLA



500+mm 4.5 – 8.0 Wide Range

- High yielding Clearfield variety released in 2016
- Mid maturity suited to medium-high rainfall regions
- Excellent early vigour, standability with medium plant height
- High oil content and reliable blackleg package - R-MR (group A)
- Suited to areas that are currently growing Hyola 575CL, 45Y88(CL) and 45Y86(CL).

SAINTLY CL

CANOLA®



500+mm 4.5 – 8.0 Wide Range

- Due for release in 2018
- High yielding Clearfield hybrid variety
- Mid maturity suited to medium – high rainfall areas
- Excellent standability under a wide range of conditions
- High oil content
- Blackleg rating R – MR (proposed) to be confirmed with further testing
- Suited to areas currently growing Hyola 575CL, 45Y88 (CL) and 45Y86 (CL).

FIELD CROPS

Corn

HM-114

CORN

- CRM 114
- Excellent yield for maturity
- Excellent seedling vigour
- Tight husk cover
- Extremely low basal tillering
- Conventional (non-Clearfield) hybrid
- Excellent stress tolerance
- Very good standability
- Maturity leader for yield
- All commercial seed produced under stringent hygiene in safe areas
- Suitable for dryland and irrigation
- Market use: Feed grain / silage.

Grain/silage



Dryland/
Irrigated



5.5 – 8.0



Wide
Range

Grain Sorghum

HGS-102

GRAIN SORGHUM

- Midge rating 7
- High yielding, medium maturity
- Good seedling vigour
- Very good standability
- Semi open head type with red grain colour
- Excellent grain size and test weight
- Well adapted and suited to all grain sorghum growing environments.



400+ mm



6.0 – 9.0



Deep
vertisols
/ duplex
red soils

HGS-114

GRAIN SORGHUM

- Midge rating of 6
- Red grain colour and semi open head type
- Medium maturity (similar to MR-Buster and Dominator/ slower than HGS-102)
- Good seedling vigour
- Medium-short in height
- Medium tillering habit with good standability
- Good grain size and test weight
- Moderate staygreen levels.



400+ mm



6.0 – 9.0



Deep
vertisols
/ duplex
red soils

Heritageseeds

BROADACRE AGENT

Heritage Broadacre Agents (HBAs) are responsible for the production, marketing, pricing and sale of the majority of our field crop products. HBAs have been selected based on their expertise in producing high quality seed combined with their local knowledge and industry experience.

The following products are sold through HBAs:

Wheat

EGA Eaglehawk

Red wheat

Einstein (feed)

Barley

GrangeR

Oxford

Oats

Williams

Mitika

Durack

Kowari

Desi chickpeas (WA and southern only)

Ambar

Neelam

Desi chickpeas (northern only)

Kyabra

Lupins

Amira Albus

Mandelup – Narrow Leaf

Faba bean

Farah

For HBA locations refer to page 188.

Note: Some of our varieties incur an End Point Royalty. Please refer to page 187.

Barley

GRANGER

BARLEY



350+ mm 5.0 – 8.0 Most soil types

- Barley Australia accredited malt variety
- Medium-late in maturity, high yielding across Australia
- Broadly adapted variety suited to a wide range of environments
- Excellent malt extraction and good diastatic power
- Excellent straw strength and resistance to lodging, improved test weight and screenings
- Resistant to powdery mildew and resistant/moderately resistant to leaf rust
- Provisional resistant rating for CCN9
- GrangeR is a starch adjunct barley with likely use in export malt and export grain markets.

OXFORD

BARLEY



400+ mm 5.0 – 8.0 Most soil types

- Late in maturing feed barley with high yield potential and wide adaptation
- One of the highest yielding varieties in SA, VIC and NSW (NVT Long Term Yield Data 2008-2013)
- Later in maturity than Baudin and Gairdner
- Larger kernel size with good head retention - excellent resistance to lodging
- Resistant to powdery mildew and resistant/moderately resistant to leaf rust
- Good grain size and test weight
- Moderate staygreen levels.

Oats

KOWARI

©ATS



400+ mm 5.0 – 8.0 Most soil types

- New potential milling variety
- Improved beta glucan 5.2% (DM basis) compared to 4.4% for Mitika
- Excellent grain quality – lowest screenings percent of all major varieties
- High protein and groat percentage
- Mid maturity similar to Mitika
- Suits most traditional oat growing areas of Australia
- Ideal replacement for Mitika
- Commercially available from 2018.

DURACK

©ATS



350+ mm 5.0 – 8.0 Most soil types

- New potential milling variety
- Early maturity milling oat (min. one week) earlier than Carrolup, Williams and Bannister
- Competitive yield similar to Carrolup and Yallora
- Excellent grain quality. Low screenings
- High groat percentage. Very good early vigour
- Widely adapted suited to mid-low rainfall areas.

WILLIAMS

©ATS



350+ mm 4.5 – 8.0 Most soil types

- Milling and feed oat
- New early maturing, mid-tall oat
- Flowers slightly earlier than Carrolup, Kojonup and Echidna. Flowers slightly later than Mitika
- Highest yielding potential milling oat variety across NVT trials in Australia
- 23% higher yielding than Carrolup and 13% higher than Wandering (mean % for WA zones)
- 18% higher yielding than Yallora and 3% higher than Bannister (mean% for all zones)
- Potential milling variety with an improved disease resistance package
- Good straw strength and standability
- Dual purpose oat, suited to hay and grain production.

FIELD CROPS

MITIKA

OATS



400+ mm 5.5 – 8.0 Most soil types

- Early maturing dwarf type milling and feed grain oat
- High yielding - suitable for all rainfall areas
- 9% higher yielding than Possum in low rainfall environments
- High groat percentage
- Low lignin and high digestibility, excellent feed value
- Superior grain size, straw strength and standability
- Moderately resistant to leaf and stem rust and bacterial blight
- Preferred Australian milling variety.

Wheat

KENNEDY

WHEAT



350+ mm 5.0 – 8.0 Most soil types

- Proven and popular variety in QLD
- Quick maturing spring wheat of semi dwarf habit
- High yellow spot resistance for a short season wheat plus tolerant of root lesion nematodes
- Higher protein than Hartog
- Very strong straw strength making it resistant to lodging
- Hard grained with high dough strength, a long mixing time and excellent baking qualities.

BAXTER

WHEAT



400+ mm 5.0 – 8.0 Most soil types

- Australian prime hard wheat
- Excellent crown rot resistance
- High yield and protein
- Very tolerant of root lesion nematodes
- Suited to main season plantings in QLD and northern NSW
- Suits early to main season planting in central QLD
- Proven variety in all QLD conditions.

STRZELECKI

WHEAT



350+ mm 5.0 – 8.0 Most soil types

- Excellent yellow spot resistance
- Slow maturing spring wheat of semi dwarf habit
- Batavia 2 replacement
- Proven variety in irrigated situations
- Strong straw, excellent yields.

EGA EAGLEHAWK

WHEAT



350+ mm



5.0 – 8.0 Most soil types

- Australian Prime Hard Wheat
- Suited to early and mid season sowing in areas of northern NSW and mid season sowing in some areas of southern NSW
- Late maturing spring wheat - early sowing variety for NSW and TAS
- Also suitable for southern QLD and VIC
- Ideal replacement for Sunbrook (similar maturity) and Strzelecki
- Late maturing genotype with moderately strong straw
- Excellent variety for early plants on irrigation
- Acid soil tolerance.

Red Wheat

EINSTEIN

WHEAT



400+ mm 5.5 – 8.0 Most soil types

- Red winter wheat
- Group 2 winter wheat on the HGCA recommended list
- Has performed extremely well across a range of situations
- Strong leaf disease package
- Late maturity, best suited to medium/high rainfall zones
- Seed based royalty. NO EPR
- Former 'World Record' yield title holder.

Chickpeas

Variety management/agronomy

Guidelines are based on optimum performance, varieties may still perform satisfactorily outside of these guidelines.

Annual rainfall: Desi type chickpeas require more than 350mm annual rainfall.

Soil type: Chickpeas are best suited to well-drained loams and self mulching clay soils of good water holding capacity. Acidic, saline and/or sandy textured soils are generally unsuitable. Avoid poorly drained soils – waterlogging tolerance is poor.

pH: Chickpeas prefer neutral to alkaline soils 6.0 – 8.0 pH (water).

Take care with seed inoculation. Treat seed with fungicide first, then apply inoculants separately just before sowing. Avoid inoculating directly into air seeded and planter bins as the seed will need to dry for a short period prior to being sown. Newly inoculated seed is often sticky and does not flow properly. This can cause uneven seed flow, resulting in patchy establishment across the paddock.

WA and Southern Only

AMBAR

CHICKPEAS



G or AgriCote

350+mm

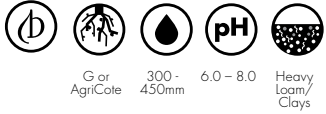
6.0 – 8.0

Heavy Loam/
Clays

- Desi chickpeas
- Tested as WACPE2136
- One of the earliest flowering lines
- Shorter plant (similar to PBA Slasher) and more bushy in appearance
- Yields particularly well in potentially high yielding situations
- Smaller grain
- Good ascochyta blight resistance.

WA and Southern Only

NEELAM CHICKPEAS



G or
AgriCote

300 -
450mm

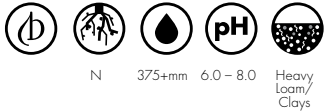
6.0 - 8.0

Heavy
Loam/
Clays

- Desi chickpeas
- Tested as WACPE2155
- Mid flowering line with excellent (tallest) plant height
- Most outstanding yielder
- Solid NVT yield performance
- Good grain quality similar to Genesis836
- Ascochyta blight resistance is better than Genesis836 and similar to PBA Slasher.

Northern Only

KYABRA CHICKPEAS



N

375+mm

6.0 - 8.0

Heavy
Loam/
Clays

- Desi chickpeas
- High yielding – 4% higher than Jimbour
- Superior pea size and quality - approximately 26 grams/100 seeds
- Excellent early vigour – ideal for deep sowing
- Improved plant height and harvestability
- Good lodging resistance
- Proven alternative to PBA Pistol in central QLD
- Seed based royalty - No EPR.



Lupins

AMIRA

LUPIN



G or
AgriCote

325 -
400mm

6.0 - 8.0

Heavy
Loam/
Clays

- Tested as WALAB2014
- Latest release out of WA program
- Has highest resistance to anthracnose
- Highest yielding of all Albus varieties
- Shorter season variety than Andromeda
- Flowers at a similar time to Kiev Mutant
- Matures about 7 days later than Kiev Mutant.

WA and Southern Only

MANDELUP

LUPIN



G

375+mm

6.0 - 8.0

Heavy
Loam/
Clays

- A broadly adapted variety with yield and agronomic/management advantages over other varieties
- Robust, high yielding variety
- Resistant to anthracnose and aphids
- High degree of phomopsis resistance
- Tolerance to broadleaf herbicide metribuzin
- Early maturity – suitable for crop topping
- High harvest height and improved seed protein
- Ideal replacement for all current varieties available that are suited to low-medium rainfall zones.



Faba Beans

FARAH FABA BEAN

Early-Mid Faba Bean



F 450+mm 5.5 – 8.0 Heavy Loam/Clays

- Farah is a direct Arabic translation for Fiesta and will be a replacement for this popular variety
- Widely grown in the southern areas of NSW, VIC and SA
- Improved ascochyta resistance for both leaf and pod than Fiesta
- Reduced grain staining from ascochyta at harvest
- A more versatile, marketable product to end users
- 2% higher yielding than Fiesta in SA.

Lentils

NUGGET LENTIL

Red Lentil



F 375+mm 6.0 – 8.0 Heavy Loam/Clays

- Mid season, high yielding red lentil commercialised by Agriculture Victoria
- Has shown excellent adaptation to the Wimmera/southern Mallee regions of VIC
- Moderately resistant to foliar infection of ascochyta blight
- Similar maturity to Digger and Cassab
- Similar seed type and quality to Digger
- Increased yield over all competitive cultivars
- Nugget lentil grain may only be sold to approved buying agents.

FIELD CROPS

What is an End Point Royalty (EPR)?

An EPR is a royalty paid on grain produced by growers. The EPR is collected by commercial seed companies and then paid to the breeding organisations. EPR is not applicable on seed retained for future sowing - only on grain sold or consumed as an "end product", eg. stock feed.

The EPR represents an equitable return to the breeding organisation for successful crop breeding. EPRs are generally reinvested back into the breeding programs, so that better varieties can be developed for Australian growers. EPR are introduced on a variety-by-variety basis.

EPR will be payable for the life of the variety in the market place (up to a maximum of 20 years) where ownership of a variety is protected under the Plant Breeders Rights Act (1994). This means an EPR will be collected on grain produced from the sowing of either purchased seed or farmer retained seed of the nominated variety.

EPR data collection process for the 2017/2018 season

With the collaboration of the major EPR Managers and Plant Breeding Companies, an initiative has been put in place to improve the efficiency of the EPR reporting process. The National Grower Register (NGR) will again be responsible for the distribution of the 2017/2018 Harvest Declaration forms and collation of all data on behalf of EPR Managers. This season growers will receive a single, combined Harvest Declaration Form, streamlining the entire collection process and reporting. This will allow growers to participate in a quick, easy and more secure production process; greatly reducing the time required to complete the form.

The Harvest Declaration Form provides information by variety, including the volumes of grain produced, sold to grain traders/end users (e.g. feedlots and millers); together with grain used on farm as stock feed, stored on farm (or in warehousing) for later sale, and also any grain retained for use as seed in the following sowing season. For further information visit www.varietycentral.com.au

Which varieties does Heritage Seeds collect for?

Heritage Seeds collects the EPR for a wide range of leading field crop varieties. The following schedule provides a list of the varieties and their respective rates.

FIELD CROPS

Heritage Seeds' EPR varieties are included in the Accredited Grain Traders Automatic EPR Deduction Agreement as listed

VARIETY	EPR RATE per tonne excl. GST
WHEAT	
Babbler Wheat	\$1.50
Baxter Wheat	\$1.45
Eaglehawk Wheat (EGA)	\$2.50
Kennedy Wheat	\$1.45
Mitre Wheat	\$1.50
Strzelecki Wheat	\$1.00
Wylah Wheat	\$1.00
BARLEY	
GrangeR Barley	\$2.95
Oxford Barley	\$2.50
OATS	
Kowari Oats	\$2.50
Mitika Oats	\$2.00
Williams Oats	\$2.30
Durack Oats	\$2.30
Export Hay Royalty*	\$2.00
PULSES	
Nugget Lentils	\$5.00
Farah Faba Beans	\$3.00
LUPINS	
Amira Lupins	\$4.00
CHICKPEAS	
Neelam Chickpeas	\$4.00
Ambar Chickpeas	\$4.00

Heritage Seeds wish to advise that this list is subject to change without any prior notification and is finalised by law. Heritage Seeds also now has available an industry standard licence agreement.

*Applies only to Williams Oats

Heritage Seeds Broadacre Agents



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WOODS SEEDS AND GRAIN -
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ASSOCIATED GRAIN - DALBY
Ph: 07 4669 9500

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MELCHIORRE SEEDS - NARROGIN
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AUSTRALIAN SEED AND GRAIN -
MOORA
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KELLERBERRIN
Ph: 08 9045 4036

TASMANIA

MIDLANDS SEED - RICHMOND
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AUSWEST SEEDS - FORBES
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HART BROS - JUNEE
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AGF SEEDS - SMEATON
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BAKER SEED CO. - RUTHERGLEN
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SOUTH AUSTRALIA

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MODRA SEEDS - UNGARRA
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