



Winter feed and forage guide

Edition 1.3

Grow with Confidence



Winter feed and forages

Winter feed and quality, dependable fodder production are important to maintaining productivity in times where pastures are not growing well enough. Well established and managed autumn-planted annual crops will allow for increased productivity at times when perennials may be growing slowly, and will remove grazing pressure from your valuable pastures, keeping them in good shape for the next growing season. Targeted and well-grown silage and hay may be essential for feeding out in dry, cold and at other challenging times, or as cash crops for sale.

There are some very useful species to consider using and, at Barenbrug, we have been developing improved cultivars to meet particular challenges and opportunities for various enterprises. Annuals, forage rapes, cereals and vetches are vitally important for winter-dominant rainfall, summer-dry areas. They also have valuable attributes for milder summer areas where winters may be colder.

New ryegrass genetics that offer potential for multiple years of winter feed are now readily available and well received. Fast-establishing specialty forage cereals and ryegrasses also offer an efficient option for topping up or over-seeding existing pastures to enhance winter feed, whether in the warmer, coastal kikuyu-based systems or the cooler inland and southern zones.

For increased feed quality, Barenbrug has an unsurpassed range of annual clovers, vetches and chicory to include in feed and fodder programs. If you are looking for productive rotational crops, a reliable spring surplus for silage or hay, or simply more feed in winter, with the right option from Barenbrug, you can grow with confidence.



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Success with winter feed and forages

Winter forages in an animal production enterprise are usually needed when:

1. There is more feed needed in the cooler times when pastures are slow; or
2. Existing perennial pastures are not up to scratch and need renewal; or
3. Fodder options are limited.

Keeping paddock records of grazing history or pasture measurements are usually the best ways of determining which paddocks to target for renewal or for topping up and oversowing. As with all successful crops and pastures, planning, preparation, timely operations, weed and pest management, grazing and using fertiliser effectively are all important factors in helping to assure a good outcome.

Key elements for the success of winter feed and fodder crops:

- Paddock records
- Soil testing
- Right species and variety to suit the job needed
- Paddock preparation for fertility, soil amendments and cultivation if required
- Sowing in a timely fashion, suitable depth, with appropriate moisture
- Appropriate fertiliser program to assure productivity prospects
- Early weed and pest control
- Grazing management.

And for silage and hay:

- Timely cessation of grazing
- Suitable application of fertiliser (and irrigation if applicable) to meet yield targets
- Ongoing pest monitoring and response as required
- Well-executed, timely harvest operations.

Which species and variety to use, and how to go about it will depend on your individual circumstances and objectives. This guide offers information on the most useful winter feed and fodder production options for much of the Australian pastoral scene. Your Barenbrug Territory Manager and other good pasture advisers will be able to offer further technical advice.



Winter feed and fodder selection chart



Requirement	Purpose		Suitable species and variety				Page	
Quality fast feed	→	Autumn and winter feed main focus, terminate crop in spring	→	General purpose	→	Leafmore Rape	→	12
			→	High performance	→	Interval Rape	→	12
			→	Fastest to first grazing	→	Falcon Leafy turnip	→	12
	→	Winter and early spring feed with good, quality silage and hay prospects	→	General purpose	→	Vortex Annual ryegrass	→	7
			→	Plus highest quality hay	→	Fuze Annual ryegrass	→	7
			→	Very late season	→	Hogan Annual ryegrass	→	7
Quality feed, ongoing	→	Later into spring or early summer or potential for a second year	→	General purpose	→	Tempo Italian ryegrass	→	8
			→	High performance	→	Arise Italian ryegrass	→	8
	→	2–3 years plus, good growing conditions	→	High performance	→	Shogun (cattle and sheep) or Samurye (cattle only) Hybrid ryegrass	→	9
			→	Tougher, drier sites	→	Barberia Hybrid ryegrass	→	9
	→	2–3 year grass free pasture/ improved feed quality	→	Highest feed quality	→	Commander Chicory	→	13
Fast, bulk feed + silage or hay	→	Early sowing (Jan–Apr)	→	Long growing season with multiple grazings possible	→	Oats (various)	→	15
	→	Mid season sowing (Mar–May)	→	Ideal for 1–2 grazings followed by a big silage crop	→	Crackerjack 2 Triticale	→	16
	→	Later sowing (Apr–Jun)	→	Fast feed for later sowing. Also excellent standing feed at maturity	→	Dictator 2 Barley	→	16
Quality & specific fodder production	→	Improved protein with bulk	→	Often sown in mixes with cereals, especially oats	→	Vetch (various)	→	18
	→	Improved protein, energy	→	Usually added to ryegrasses	→	Clovers (various)	→	10
	→	Late option, bulk quality feed	→	Suits late winter and early spring sowing	→	Pea & Oat Spring Silage Blend	→	22
	→	Long-season grazing and fodder production	→	General purpose	→	Renovator Oats + Rye		23
	→	Autumn/winter sown silage production	→	Quality bulk silage or hay	→	Renovator Oats + Vetch		23

Fast-feed ryegrasses (*Lolium spp.*)

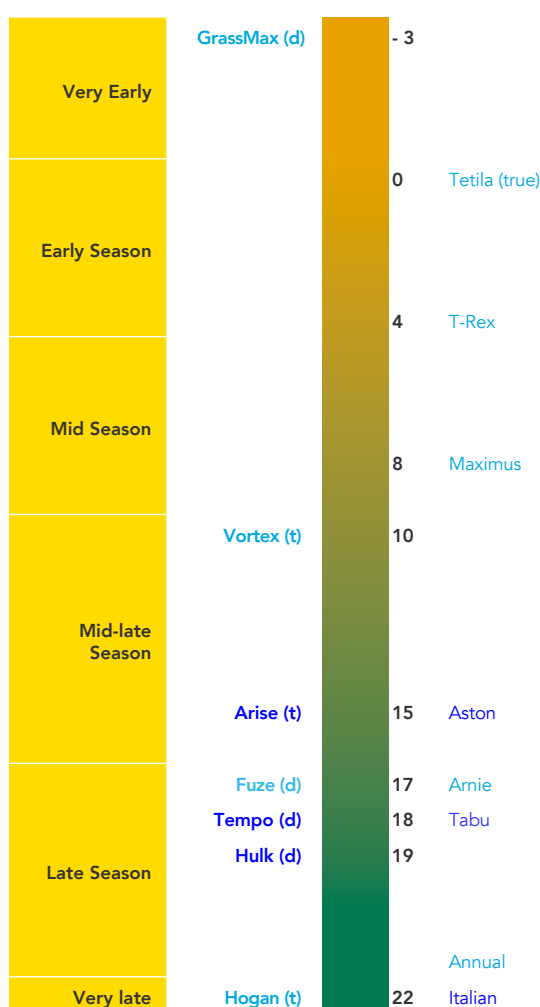
Short-term ryegrasses are a popular and highly reliable autumn, winter and spring forage with terrific prospects for one or a number of fodder crops in spring. There are three main categories that suit winter feed and forage production:

Annual ryegrass is popular in areas with winter dominant rainfall and dry, hot summers. Often used for quick autumn and winter feed and/or as a silage, hay or green manure crop, particularly where there is no expectation or requirement for summer growth.

Italian ryegrass has application in areas where late spring growth is reliable, or where summers are mild and a second year may be required. It is very useful for oversowing into existing pastures as a boost for a year or two.

Hybrid ryegrasses work well where multiple years are required with very good autumn and winter growth, and the persistence of true perennial ryegrass may be unreliable. They are also excellent for oversowing. This category of ryegrass offers potential for summer production where moisture and conditions allow.

Italian and annual ryegrasses



Italian and annual ryegrass heading dates

■ Italian ryegrass ■ Annual ryegrass

Ryegrass heading date (relative time to reach flowering stage) is an important consideration when selecting varieties to suit production systems. It is often beneficial to have a range of heading dates on farm.

As a general rule, the earlier the heading date, the more late winter growth potential and a more pronounced peak in spring growth. Conversely, it is typical for late heading date varieties to exhibit a little less winter growth, have a longer but steadier spring flush, thus allowing for greater flexibility and extended pasture quality into early summer.

Earlier 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 more feed in late winter/early spring
- Allow for allocation of paddocks for fodder conservation, later paddocks being grazed
- May be considered for sites where lower input costs are justified.

Later varieties:

- Suit sites where the spring season holds on longer and for irrigation
- 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
- Better prospects for a second or third cut
- More usually suited to sites where higher outputs are being targeted.

Annual ryegrass (*L. multiflorum*, *L. westerwoldicum*)



Annual ryegrasses are sown for a high quality, short-term winter crop, providing multiple grazings in winter and spring. They are 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, as annuals die out, allowing space for weeds to take over. They also establish rapidly and compete strongly with perennial species.

Vortex Annual ryegrass



500mm+



Most soil types



4.8–8.0



- 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.

Fuze Annual ryegrass



550mm+



Most soil types



4.8–8.0



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

Hogan Annual ryegrass



600mm+



Most soil types



4.8–8.0



- 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.

Useful co-species:

Italian ryegrass, white clover, red clover, annual clovers, chicory and forage rape.

Sowing & grazing window

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Plant	►	►●	●	●	●◄	◄						
Feed			►	►	►●	●	●	●	●	●◄	◄	◄

► Earlier than ideal, but acceptable ● Optimum time ◄ Later than ideal, but acceptable

Italian ryegrass (*L. multiflorum*)

Italian ryegrasses are sown as highly productive short-term pastures in areas with mild summers or where late season rains or irrigation may permit pasture growth into late spring and early summer. They are also well suited to oversowing into run-down pastures and may be sown in spring where summer moisture is reliable. Italian ryegrass can persist for 2–3 years in summer mild areas under irrigation or reliable summer rainfall.





In summer-dry or summer-hot areas, it will generally thin out over summer, being productive for only one year, but will continue to produce quality feed through spring and into early summer, giving it an advantage over annual ryegrasses. Italian ryegrass also establishes rapidly and competes strongly with perennial species. Some farming operations oversow annually or biennially to maximise the benefits of strong cool season growth with late season quality. Italian ryegrasses from Barenbrug will not cause staggers.

Arise Italian ryegrass

 650mm+
  Most soil types
  4.8–8.0
 

- New tetraploid Italian ryegrass
- High forage yield - even better than Aston
- Great all-season performance
- Fast establishment and high winter yield
- Good carry through to second year in favourable climates
- Late maturity for feed quality through spring.

Tempo Italian ryegrass

 500mm+
  Most soil types
  4.8–8.0
 

- New high performance diploid Italian
- 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 oversowing
- Has become the new benchmark variety in this category.

Useful co-species:

Annual ryegrass, hybrid ryegrass, white clover, red clover, annual clovers, chicory and forage rape.

Sowing & grazing window

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Plant	►	►●	●	●	●◄							
Feed			►	►	►●	●	●	●	●	●	●◄	◄

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Ryegrass sowing rates

Type	Variety	New sowings				Oversowing	
		High input/ irrigation	Good dryland	Marginal dryland	In mixes as main grass component	Existing ryegrass, lucerne, clover etc.	Existing Kikuyu
Annuals	Vortex	25–35	25	20	20–25	20–25	35–50
	Fuze	20–25	15–20	12–15	15–20	15–20	25–35
	Hogan	25–35	25	20	20–25	20–25	35–50
Italians	Aston / Arise	25–35	25	20	20–25	20–25	35–50
	Tempo	20–25	15–20	12–15	15–20	15–20	25–35
Hybrids	Shogun	25–35	25	20	20–25	20–25	35–50
	Barberia	20–25	15–20	10–15	12–18	10–15	Rarely

*In some circumstances there have been benefits from adopting higher sowing rates.

Hybrid ryegrasses (*L. hybridum*, *L. boucheanum* syn.)



This category of grass is well suited to specialist high performance paddocks, and is also very suitable for oversowing and topping up thinning older stands. Hybrid ryegrasses are generally produced by plant breeders crossing Italian ryegrass with perennial ryegrass. Hybrid ryegrasses tend to fall between Italian and perennial ryegrasses in growth and persistence, but varieties vary widely. Some are more similar to Italian ryegrass and some to perennial ryegrass.

Hybrids provide better winter production than perennial ryegrass and are best used in mild summer areas where they may persist for 3–5 years. Samurye, Shogun and Barberia hybrid ryegrasses will last for a number of years supplying very high quality feed year round. They require less frequent re-sowing than annual, Italian or many other (shorter-term) hybrids. For sites requiring winter performance with some summer hardiness, Barberia is a remarkably reliable option. Where winter and summer performance are expected, late maturity Samurye and Shogun are standout options.

Shogun Hybrid ryegrass

650mm+
 Most soil types
 4.8–8.0

- A true breakthrough in grass breeding
- Very late flowering (+26 days)
- Exceptionally high yield potential, matching the best Italian ryegrasses
- High winter growth and good summer production
- Grows like an Italian and persists for multiple years
- Ideal for oversowing run-down pastures
- Suited to farm systems requiring exceptional autumn, winter and summer performance
- NEA endophyte: Good insect tolerance, no staggers.

Samurye Hybrid ryegrass

700mm+
 Most soil types
 4.8–8.0

- 2-4 year pasture for highest productivity dairy and beef systems
- Very late (+26 days) maturity maintains feed quality well into summer
- Tetraploid grass in a high performance ryegrass/clover pasture
- Also ideal for over-sowing existing perennial, hybrid or Italian ryegrass swards.
- Improvement and/or replacement for Shogun and similar types
- NEA12 endophyte: Excellent for managing black beetle, root aphid and Argentine stem weevil.
- Dairy and beef cattle only.

Barberia Hybrid ryegrass

500mm+
 Most soil types
 4.8–8.0

- Very early flowering (-21 days) and 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 oversowing, endophyte free = no staggers.

Useful co-species:

Italian ryegrass, white clover, sub clover, red clover, annual clovers and chicory.

Sowing & grazing window

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Plant	►	►●	●	●	◄							
Feed			►	►	►●	●	●	●	●	●	●	●

► Earlier than ideal, but acceptable ● Optimum time ◄ Later than ideal, but acceptable

Annual clovers

Annual clovers offer 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 subsequent crops or pastures.

Annual clovers are best 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. These clovers are generally annual options only, however hard-seeded varieties (e.g. Vista balansa, Zulu II arrowleaf, Nitro Persian) can be locked up just prior to flower initiation. They will then flower and set seed, thus providing a seed-bank.

Balansa clover (*Trifolium michelianum*)

1–3 kg/ha (in a mix)

Versatile option 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 to good winter growth. Often used as part of a High Density Legume (HDL) mix as the earliest flowering component. Also useful as an addition or 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.

Vista

Balansa clover



650mm+



C or **AgriCote**



4.8–8.0



Wide range

- Late season maturity – approximately 130 days
- Superior spring/early summer growth
- Tolerates waterlogging and mild soil salinity
- 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.

Arrowleaf clover (*Trifolium vesiculosum*)

3–6 kg/ha (in a mix)

Suitable for medium rainfall areas that suits well-drained soils of acid–neutral pH and tolerates mild salinity. Good 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 a later flowering component.

Zulu II

Arrowleaf clover



400mm+



C or **AgriCote**



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.

Persian clover (*Trifolium resupinatum*)



3–6 kg/ha (in a mix)

Highly reliable option for medium rainfall areas that suits most soils of mildly acidic–moderately alkaline pH. Tolerates mild salinity and some waterlogging. Suitable for grazing and fodder conservation with fair to good winter growth. It is later flowering than balansa and an essential component in HDL mixes. Also useful as an addition to sub-clover in longer-term pastures, or to add bulk and quality to annual and Italian ryegrass hay crops. Regenerates by re-seeding. Hard-seeded and soft-seeded varieties available.

Laser Persian clover

550mm+
 C or **AgriCote**
 5.5–8.0
 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
- Superior quality to Maral or Shaftal
- Suitable for mixes with short-term ryegrass
- Typically 20–30% more DM yield than Shaftal.

Lightning Persian clover

450mm+
 C or **AgriCote**
 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.

Nitro Plus Persian clover

325mm+
 C or **AgriCote**
 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
- Suitable for haymaking and grazing
- Excellent cereal rotation legume
- Supersedes Kyambro.

HDL mixes

High Density Legume (HDL) blends are a very useful finishing option, and may also be used in rotations for weed management and nitrogen fixation. Balansa, Persian and arrowleaf clovers are often key components in two, three or four-way HDL mixes, usually sown at 8–15 kg/ha. Berseem, crimson and some sub-clovers may also be considered.

Sowing & grazing window

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Plant	►	►●	●	●◄	◄							
Feed					►	►	►●	●	●	●	●◄	◄

► Earlier than ideal, but acceptable ● Optimum time ◄ Later than ideal, but acceptable

Forage rape and leafy turnips

Forage rape (*Brassica napus*) 3–4 kg/ha (1–2 kg/ha in a mix)

Leafy turnips (*Brassica campestris* spp. *rapa*) 5–8 kg/ha (2–4 kg/ha in a mix)

Rape is a fast-maturing leafy, single or multi-graze crop that can be sown for summer, autumn or winter feed. Rape has a broader adaptation than most other brassicas and can be used with great success for winter feed. Leafy turnips are forage brassica hybrids that may be utilised in a similar manner to rape and usually offer feed a little more quickly although are typically lower yielding.

Rape can be sown from the prior spring through summer and into mid-autumn. It is most usually sown as a lone stand, but may be sown in combination with other autumn forages such as annual or Italian ryegrass with good results. Rape's feed value is high, but usually the crop must be mature before grazing, approximately 10–12 weeks after sowing. In many cases modern cultivars may be grazed from 8–10 weeks and when well-proportioned with other co-species, may be grazed earlier if required.

Leafmore

Forage rape



450mm+



5.5–8.0



Well drained

- 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.

Interval

Forage rape



450mm+



5.5–8.0



Well drained

- Tall, fast-establishing rape
- Excellent for both summer and winter feed
- Offers valuable feed opportunities for farmers wanting to finish stock
- Strong frost tolerance and resistance to powdery mildew
- Suitable for 1–2 or more grazings from a late summer early autumn sowing.

Falcon

Hybrid leafy turnip



500mm+



5.5–8.0



Well drained

- 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.

Sowing & grazing window

Leafmore
forage
rape

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Plant	▶	▶●	●	●◀	◀							
Feed				▶	▶●	●	●	●◀	◀	◀		

Interval
forage
rape

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Plant	▶	▶●	●◀	◀								
Feed				▶	▶●	●	●◀	◀	◀			

Falcon
hybrid
leafy
turnip

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Plant	▶	▶●	●	●◀	◀							
Feed			▶	▶●	●	●	●	●◀	◀	◀	◀	

▶ Earlier than ideal, but acceptable ● Optimum time ◀ Later than ideal, but acceptable

Typical sowing times

Brassicas should be early autumn sown—when soil temperatures are still up around 12–14 degrees or higher.

Cool-temperate areas

Southern and highland Victoria, coastal South Australia and Tasmania: (Mid Feb – early April).

Warm-temperate areas

Northern Victoria, inland South Australia, New South Wales, southern Queensland, coastal southern Western Australia: (Early March – late April/early May).

Chicory (*Cichorium intybus*)



6–8 kg/ha (2–4 kg/ha in a mix)

Chicory offers an opportunity for diversifying the feed base, a grass-free break, or to help resolve feed gaps or problematic pasture areas. Typically it is most productive and manageable as a sole stand, both in terms of getting the best yield and addressing weed issues. Mixtures with other species are often popular, and chicory has the ability to improve the timeliness and quality of feed on offer by contributing to metabolisable energy (ME), digestibility and palatability of mixed swards. It is often used as a 1–3 year forage in combination with short-term grasses and clovers or forage brassicas. Chicory is also a useful oversowing option for older lucerne stands.

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 or irrigation. It has potential for high dry matter of excellent quality with most growth through warmer periods. Chicory should be sown at 6–8 kg/ha as a sole stand or at 2–4 kg/ha as part of a grass-clover mix, and is suited to sowing in early autumn, spring and early summer where circumstances allow.

Reliable establishment of chicory usually requires a well prepared seed bed and soil temperatures of over 11–12°C. Chicory should be rotationally grazed on a 4–6 week rotation and will require added nitrogen for maximum performance. Avoid grazing with heavier stock classes in wet conditions as trampling may affect stand density and longevity.

Commander Chicory



550mm+



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.

Sowing & grazing window

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Plant	►	►●	●	●◄	◄							
Feed					►	►	►	►●	●	●	●	●

► Earlier than ideal, but acceptable ● Optimum time ◄ Later than ideal, but acceptable



Forage cereals

Forage cereals are quick to establish and have strong winter and spring growth. Well managed crops produce moderate to high quality feed that can either be directly grazed or cut and conserved as hay or silage.

The Barenbrug 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.

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. Oats and barley may also have application for late winter and early spring sowing in southern-most areas with excellent results.

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.

	500mm rainfall	600mm rainfall	700mm rainfall	800mm rainfall	Irrigation
Sowing rates kg/ha	40–60	70–90	80–90	80–100	100–120

Sowing:

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. Sowing depth should be between 10–35mm, although slightly deeper sowing is often still satisfactory.

Grazing:

Forage cereal crops are generally ready for a light first grazing when 25-30cm 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. True forage cereals have increased capacity for re-tillering after grazing. As the crop develops in late winter and early spring, be sure to check that the growing point or first node (Zadok's 31) is not being removed. Grazing after nodes start forming will very likely reduce subsequent silage or hay yield potential.

Forage oats (*Avena sativa*)



60–100 kg/ha

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 slower to establish if sown 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.

Express Forage oat

400mm+
 Most soil types
 5.5–8.0

- 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
- Replacement for Mammoth.

Sorcerer Forage oat

400mm+
 Most soil types
 4.5–8.0

- Currently resistant to all Australian pathotypes of leaf-rust
- Reduced reliance on fungicide programs
- Quick to first grazing
- Semi-erect early growth habit to assist with grazing management
- Excellent recovery from grazing and cutting
- Medium-late maturity
- Bred, trailed and selected in Qld & northern NSW for performance and local adaptation.

Genie Forage oat

400mm+
 Most soil types
 4.5–8.0

- Excellent seedling vigour leading to more early growth
- Very late maturity which stays leafy into late spring
- Widely used, well regarded variety
- Suits northern and southern climate zones.

Warlock Forage oat

400mm+
 Most soil types
 4.5–8.0

- New forage oat released in 2019
- Bred by Queensland Department of Primary Industries (QDPI)
- Excellent recovery from grazing and cutting
- A significant step-change in DM yield - 18% higher than Genie.

Sowing & grazing window

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Plant	►	►●	●	●	●	●	●◄	◄	◄			
Feed			►	►	►●	●	●	●	●	●◄	◄	◄

► Earlier than ideal, but acceptable ● Optimum time ◄ Later than ideal, but acceptable

Forage triticale (*X Triticosecale*)

60–120 kg/ha

Triticale is a cross between wheat and cereal rye or ryecorn. 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 is retained.

Crackerjack 2

Forage triticale

 450mm+
  Most soil types
 4.8–8.0
 

- 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.

Sowing & grazing window

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Plant	▶	▶●	●	●	●	●	●◀	◀	◀			
Feed			▶	▶	▶●	●	●	●	●	●◀	◀	◀

▶ Earlier than ideal, but acceptable ● Optimum time ◀ Later than ideal, but acceptable

Forage barley *Hordeum vulgare* (*H. distichum* L)




60–100 kg/ha

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 programs that may include later finishing crops like corn, maize or sorghum and an earlier finish offers the best chance of following summer crops being sown earlier.

Dictator 2 is a hooded or awnless type, thus making it suitable for hay production, or it is very useful for use as standing summer feed. Dictator 2 is far less prone to lodging than other barleys.

Dictator 2

Forage barley

 450mm+
  Most soil types
 5.4–8.0
 

- 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.

Sowing & grazing window

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Plant		▶	▶	▶	▶●	●	●	●◀	◀	◀		
Feed				▶	▶	▶	▶●	●	●	●◀	◀	◀

▶ Earlier than ideal, but acceptable ● Optimum time ◀ Later than ideal, but acceptable

Quality and best value from forage cereals

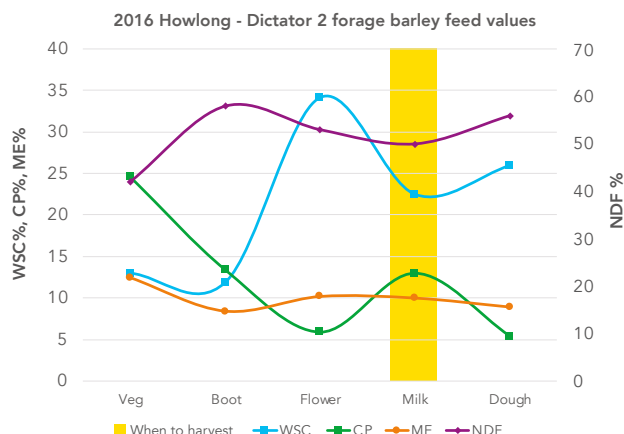
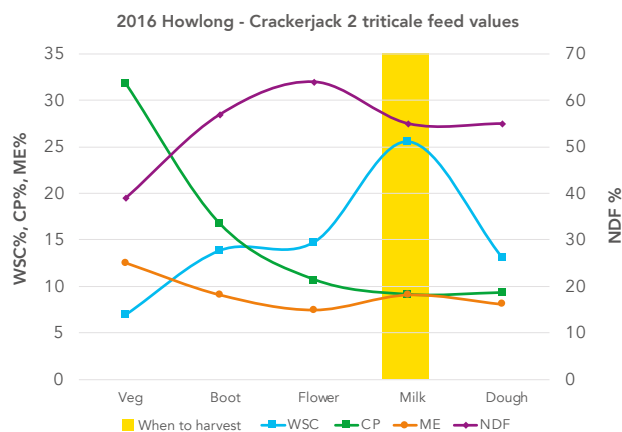
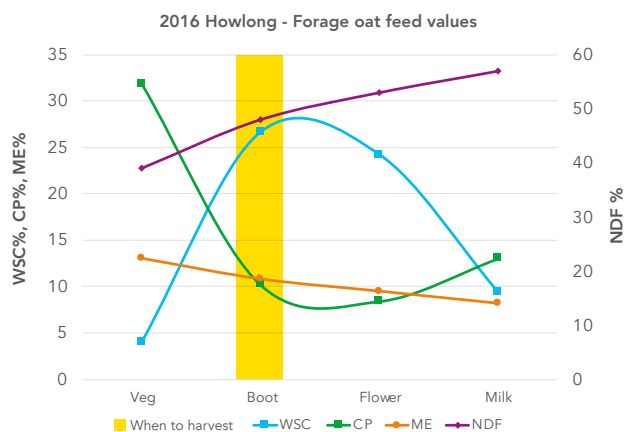


Whilst cereals are often required to provide simple bulk feed, there are opportunities to ensure that higher quality fodder may be produced. Continuing trial work at Howlong, New South Wales since 2014, has been developing some key information to support potential beneficial options such as forage cereal mixtures with other species, and to offer information to guide harvest timing.

Where cereals were sown either as a sole species or with 20% annual ryegrass (Vortex), feed testing of harvested Crackerjack 2 triticale and Mammoth oats returned a comparative step up in energy levels. Test results reliably indicate an improvement for energy of 0.5 to 0.7 ME MJ/kg DM of the mix compared to the straight cereal sowings. There are also reliable yield benefits in the grazing season and post silage harvest with some very useful re-growth potential from the grass in favourable situations.

Best harvest timing for forage cereal hay or silage quality		
Oats	Harvest at Boot stage	Excellent ME 10–11 MJ/kg DM
	(just before or at ear emergence)	Low NDF, excellent WSC, OK NDF 48%
	Later harvest will offer more yield, although energy declines markedly.	
Triticale	Harvest at Milk stage	Good ME of 9–9.5 MJ/kg DM
	(completion of grain fill)	High sugars, moderate NDF
	Late dough harvest will have a lower sugar content (WSC, but ME and NDF stable)	
Barley	Harvest at Milk stage	Excellent ME of 10–10.5 MJ/kg DM
	(completion of grain fill)	Low NDF, OK protein
	Harvesting at dough stage lowers CP, increases NDF a little, but still very good.	

DM Dry matter in feed. **ME** Metabolisable energy as megajoules per kilogram of DM. **WSC** Water soluble carbohydrates (sugars) as % of DM. **CP** Crude protein as percentage of DM. **NDF** Neutral detergent fibre – slowly or largely indigestible percentage of DM.



Cereal rye (ryecorn, rye) *Secale cereal* 40–75 kg/ha

Ryecorn has the potential for useful quick winter feed in a late autumn 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 are likely to have poor stock acceptance with very high fibre (70% plus NDF) and little feed value with ME of under 7.5 MJ/kg DM.

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 highly sought as a fodder to support dairying due to excellent quality and palatability. 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 all of which may be used for grazing or hay:

Common vetch (*Vicia sativa*)

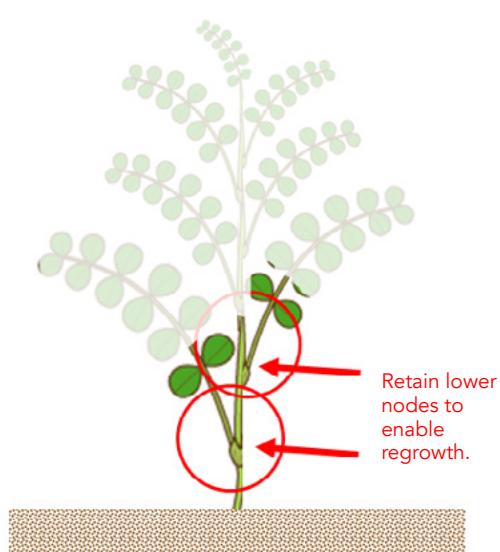
e.g. Morava, Rasina, Volga, Languedoc and Blanchefleur. Larger seed size, lower % hard-seeded than other vetches. Usually faster to establish than other vetch types.

Woolly-pod vetch (*Vicia villosa*)

e.g. Capello, RM4, Haymaker and Namoi. 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 in suitable circumstances.

Purple vetch (*Vicia benghalensis*)

e.g. Popany. Grazing, silage, hay, grain hard-seededness varies with cultivars (Purple vetch now very much outclassed by new common and woolly-pod types.)



Sowing

Initial weed control is usually essential for a good crop. Spray-fallow or stale-seed bed should be incorporated into the program. Vetch may be an initially slow crop to develop, but once well-established, vetch is relatively competitive compared to other legumes.

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
July–August (or later)

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

There is some variation in seed sizes, common vetch the largest, woolly-pod the smallest, requiring allowance for seeding rate, depending on the species being sown. Target plant densities are usually from 40 to 70 plants/m². Cereal vetch mixes are generally about 2:1 to 1:2 w/w, depending on seed sizes, and desired outcome.

Sowing depth:

Heavier soils: 10–20 mm

Lighter soils: 15–40 mm

Vetch – typical sowing rates kg/ha				
	Sole stand		In a mix (cereal)	
Species	Lower rainfall	Higher rainfall	Lower rainfall	Higher rainfall
Common vetch	30–50	50–70	25–40	30–50
Woolly-pod vetch	15–30	30–40	15–25	25–30
Purple vetch	30–40	40–60	20–30	30–40

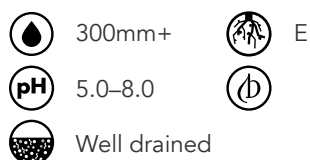
Grazing

There is some potential for carefully managed grazing of vetch crops. During the growing phase, allow the plant to develop secondary nodes prior to grazing, and manage grazing such that a good number of these are preserved to provide for regrowth potential. Common vetch may be grazed through flowering or as a standing hay crop. Woolly-pod vetch must not be grazed after pod-set.



Volga

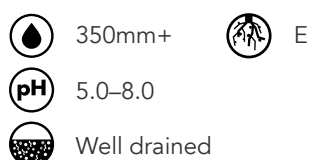
Common vetch



- 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.

Morava

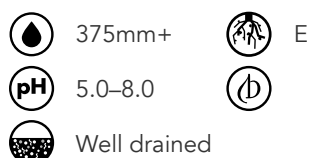
Common vetch



- 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.

RM4

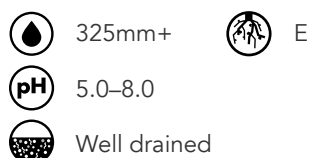
Woolly pod vetch



- 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.

Haymaker

Woolly pod vetch



- 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.

Sowing & grazing window

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Plant		►	►●	●	●◄			◄	◄	◄		
Feed						►	►●	●	●	●◄	◄	◄

► Earlier than ideal, but acceptable ● Optimum time ◄ Later than ideal, but acceptable

Winter forages - Quick reference guide

Variety/ies	Fuze	Vortex Hogan	Tempo Hulk	Arise	Shogun Samurje	Barberia	Commander	Vista, Lightning, Nitro Plus, Laser, Zulu II	Leafmore	Interval	Falcon	Various	Crackerjack 2	Dictator 2	Volga Morava	RM4 Haymaker
Type	Annual ryegrass (diploid)	Annual ryegrass (tetraploid)	Italian ryegrass (diploid)	Italian ryegrass (tetraploid)	Hybrid ryegrass (tetraploid)	Multi-year, hardy ryegrass	Chicory	Balansa, Persian & Arrowleaf clovers	Hardy Rape	Tall Rape	Leafy Turnip	Oats	Triticale	Barley	Common Vetch	Woolly Pod Vetch
Stock Classes ¹	D, B, L, W	D, B, L, W	D, B, L, W	D, B, L, W	D, B, L, W	D, B, L, W	D, B, L, W	D, B, L, W	D, B, L, W	D, B	D, B, L, W	D, B, L, W	D, B, L, W	D, B, L, W	D, B, L	D, B, L
Fodder Options	Fodder Options	Silage, Hay	Silage, Hay	Silage, Hay	Silage, Hay	Silage, Hay	-	Silage, Hay	-	-	-	Silage, Hay	Silage	Silage, Hay	Silage, Hay	Silage, Hay
		20–25	25–35	20–25	25–35	20–25	6–10	Usually in grass mixes	4	4	6–8	100	100–120	85–100	50–70	40–50
		15–20	25	15–20	25	15–20	4–6		3	3	4–6	80–100	100	75–80	40–60	30–40
		12–15	20	10–15	20	10–15	2–4		2	2	2–3	60–80	60–80	50–60	30–40	25–30
		15–20	20–25	15–20	20–25	12–18	1.5–3.0		0.5–2.0	0.5–2.0	2–3	25–50	25–50	25–50	25–40	20–25
		15–20	20–25	15–20	20–25	10–15	4–6	rarely	-	-	-	40–80	40–80	40–80	-	-
Oversowing Kikuyu	25–35	35–50	25–35	35–50	35–50	rarely	-	rarely	-	-	-	80–100	80–100	-	-	-
Sowing time ³	Early autumn	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	-	Useful	Good	Good
	Mid autumn	Ideal	Ideal	Ideal	Ideal	Ideal	OK	Good	Good	OK	Good	Ideal	Ideal	OK	Ideal	Ideal
	Late autumn/winter	OK	OK	Useful, but slow to get going if late sown		Avoid		Usually slow	Little winter growth if late sown		OK		OK	Ideal	OK in mild winter areas	
	Early spring	Useful	Useful	Good for areas with extended spring season		Ideal		OK in mild summer areas	May bolt if sown too early		OK	OK for extended spring areas		Good in late spring areas		
Suggested min 9am Soil C° at sowing date	8–10	8–10	8–10	8–10	8–10	8–10	12–14	12–14	12–14	12–14	12–14	8–10	8–10	8–10	12–14	12–14
Weeks to first graze ⁴	7–8	7–8	7–8	7–8	7–8	8–10	7–10	8–10	8–10	10–12	'6–8	7–10	7–10	7–10	10–14	10–14
Regrowth capacity ⁵	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Good	Excellent	Excellent	Excellent	Excellent	Limited	Limited
Guide to number of grazings typically possible	Many	Many	Many	Many	Many	Many	Many	Many	2–3 +	1–2 +	3–4 +	2–3 +	1–2 +	1–2 +	one	one

Nutritional features ⁶ (typical analysis)	Vegetative growth																	
	Whole crop % DM	16–18				16	15 - 17		14–15	14–15	14–15	22–30	25–35	20–30	17–24	16–25		
	Whole crop ME MJ/kgDM	11–12.5				11–12	11 - 12		11–13	11–13	11–13	9–11.5	9.5–12.5	9.5–12.5	9.5–12	10.5–13		
	Whole crop CP%	16–25				11–13	17 - 27		17–20	17–20	17–20	9–14	10–15	10–16	18–30	18–30		
	Whole crop NDF%	35–42				18–30	24 - 32		22–25	22–25	16–19	40–55	40–55	40–55	30–40	32–45		
Nutritional features ⁶ (typical analysis)	Silage (good timing)																	
	ME MJ/kgDM	9.5–10.5				Only ensile when in mixed swards	8.5 - 11		Silage is possible although rarely is it purposefully made. Having 10-30% forage rape in a mixed sward silage with grass or cereals can be reasonably good								Feed values similar to good vetch hay. Use of silage inoculant is essential for good results	
	CP%	14–20					15 - 22								9–10.5 9–12.5			
	NDF%	50–60					40 - 55								45–55			
Hay (well made)																		
	ME MJ/kgDM	8–9.5				Unsuitable for hay	7.5 - 11		Rarely taken for hay						9–10.5		8.5–11	9–11
	CP%	10–12					15 - 22								7–12		17–22	15–25
	NDF%	55–65					40 - 60								45–60		35–45	42–55
Co-species Compatibility ⁷	Annual ryegrasses	Excellent	Excellent	Excellent	Excellent	rarely	Good	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Rarely in mixes other than with cereals		
	Italian ryegrasses	Excellent	Excellent	Excellent	Excellent	Good	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent			
	Shogun ryegrass	rarely	Excellent	Excellent	Excellent	Good	Excellent	Excellent	Good	Good	Good	Rarely justified	Rarely justified					
	Barberia ryegrass	rarely	Excellent	Good	Good	Good	Excellent	Good	Good	Good	Good	Rarely justified	Rarely justified					
	Annual clovers	Good	Excellent	Excellent	Excellent	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Cereals usually too competitive to assure good clover content						
	White clover	rarely	Good	Good	Good	Excellent	Excellent	Good	Good	Good	Good							
	Red clover	rarely	Good	Good	Excellent	Excellent	Good	Good	Good	Good	Good							
	Sub-clovers	rarely	Good	Good	Excellent	Good	Good	Good	Good	Good	Good							
	Forage rapes	Excellent	Excellent	Excellent	Excellent	Good	Good	Good				Can be a very good mix						
	Chicory	Good	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Rarely justified						
	Forage cereals	Excellent	Excellent	Excellent	Excellent	rarely	rarely	Cereals usually smoother	Can be a very good mix		Excellent	Excellent	Excellent	Excellent	Excellent		Excellent	
	Vetch	Vetch rarely mixed with ryegrasses as will be out-competed as a rule				rarely	rarely	Rarely justified	Rarely justified			Excellent	Excellent	Good				




1. D Dairy, B Beef, L Lamb/intensive sheep, W Wool/extensive sheep
2. Sowing rates and relative success will depend on various field factors and management applied. Higher rates for high production expectations.
3. Earlier dates will largely only suit cool-temperate areas. Warm/hot summer areas should sow towards the end of the window. Early spring sowing dates are the reverse: warm/hot areas sow earlier for best results.

4. Typical minimum growth times with suitable moisture and growing conditions. Slow germination and plant stresses will likely delay crop development.
5. Plant potential due to specific characteristics: provided moisture, nutrients, seasonal conditions and management are adequate.
6. Indicative figures only. Plant density and growing conditions may markedly affect nutritional factors. Harvested fodder values highly dependant on seasonal conditions, timing and management applied.
7. Crop growth characteristics typically observed, and resulting comments made as suggestions for best outcomes.

Pasture and Fodder mixes

Renovator SR

Premium pasture blends

-  500mm+
-  4.5–8.0
-  Wide range
-  **AgriCote**





Quality grazing and fodder 1–2 years

Renovator SR offers the combination of Hogan for fast establishment and high winter growth and Tempo 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	%
Tempo	Italian ryegrass	30
Hogan	Annual ryegrass	50
Laser	Persian clover	20
Sowing rate: 25–30kg/ha		

Meatmaster ST

Premium pasture blends

-  500mm+
-  4.8–8.0
-  Wide range
-  **AgriCote**






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 500mm+ winter dominant rainfall broad acre systems.

Variety	Species	%
Vortex	Annual ryegrass	80
Laser	Persian clover	10
Vista	Balansa clover	10
Sowing rate: 20–25kg/ha		

Renovator Spring Silage Blend

Premium pasture blends

-  500mm+
-  4.5–8.0
-  Wide range
-  Wide range
-  **E**

High yield silage crop (pea and oat mix)

This 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. Express 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	%
Express	Forage oats	40
Morgan	Field pea	60
Sowing rate: 120–180kg/ha		

* Mix components may vary depending on availability, although will have matched agronomic attributes.



Renovator Oats and Rye

Grazing and silage/hay



500mm+



4.5–8.0



Wide range

Long-season grazing and fodder production.

Renovator Oats and Rye blend offers the combination of rapid establishing and fast-growing Express forage oats with both a tetraploid and a diploid annual ryegrass. This is an annual or seasonal option which is ideal for grazing, silage or hay. This combination will provide excellent autumn feed which will continue through winter and the ryegrass offering the opportunity for late spring production. Harvest when the oats are in the boot stage (just before ear-emergence) for best feed quality.

Variety	Species	%
Express	Forage oats	70
Hogan	Annual ryegrass	17.5
Fuze	Annual ryegrass	12.5
Sowing rate: 60-80 kg/ha		

Renovator Oats and Vetch

Quality Silage



500mm+



4.5–8.0



Wide range

Autumn/winter sown silage production

Oats and vetch mixes are well regarded for producing reliable yields of high-quality silage, particularly in dryland, extensive cropping systems. Express oats provide yield, energy and the reliable bulk for the crop and the vetch adds energy and improves digestibility, stock acceptance resulting in pleasing animal performance. For highest feed quality, harvest when the vetch is into the flowering stage and the vetch pods are just starting to form.

Variety	Species	%
Express	Forage oats	70
Volga	common vetch	30
Sowing rate: 100-160 kg/ha		

Notes

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