

FORAGE LEGUMES & HERBS

WHITE CLOVERS A perennial legume used in pasture mixes to fix nitrogen and to provide high quality forage. Best used on moderate to highly fertile soils. Spreads predominantly by stolons and by producing roots at the stolon nodes to form new plants. Regeneration by seed under lax grazing also occurs. Lax infrequent grazing is recommended for the large leaved types and close frequent grazing for the small leaved types. White clover is susceptible to shading during development so do not let newly sown pastures become too rank. If clover root weevil is a problem, consider using higher sowing rates and additionally add chicory and red clover to the mix. Consider also mixing large leaved with medium leaved cultivars to the mix, or medium and small leaved cultivars where this management is required.

Cultivar	Leaf size : L = large, ML = medium/large, M = medium, S = small, VS = very small	Sowing Rate in kg/ha (bare equivalent)		Minimum Annual Rainfall (mils)	Soil Fertility	Seasonal Growth Peaks	Persistence in Years	COMMENTS
		Alone	Mixture					
Abernour	L	3-5	600	Medium-High	Spring to Mid-Autumn	3+	Large leaved type. Bred for stress tolerance, grazing tolerance, pest and disease resistance. Suited for lax rotational dairy or beef grazing systems and for silage use.	
Klondike	L	3-5	600	Medium-High	Spring to Mid-Autumn	3+	Large leaved type. Erect habit, good stolon density. Good late winter, early spring and summer production. Suited for lax rotational dairy or beef grazing systems and for silage use.	
Grasslands Kopu II	L	3-5	600	Medium-High	Spring to Mid-Autumn	3+	Large leaved type. Very high stolon density. High yields annually with improved spring to autumn growth. Improved soluble carbohydrate levels. Some clover root weevil tolerance. Suited for dairy or rotational grazing beef systems.	
Grasslands Mainstay	L	3-5	600	Medium-High	Spring to Mid-Autumn	3+	Large leaved type with improved persistence and production. Shows good recovery after summer drought. Some tolerance to clover root weevil. Suited for dairy or rotational grazing beef systems.	
Grasslands Kakariki	L	3-5	600	Medium-High	Spring to Mid-Autumn	3+	Large leaved type with improved stolon density, N fixation, persistence and production. Suited for dairy or rotational grazing beef systems.	
Kotare	L	3-5	600	Medium-High	Spring to Mid-Autumn	3+	Large leaved cultivar with high stolon growing point density for a large leaved clover. High total yield with excellent summer and autumn yielding ability. Suited for dairy and beef intensive or lax rotational grazing systems.	
Klondike	L	3-5	600	Medium-High	Spring to Mid-Autumn	3+	Large leaved cultivar with erect growth habit. Good re-growth from grazing. Suited for dairy systems.	
Legacy	L	3-5	600	Medium-High	Spring to Mid-Autumn	3+	Large leaved type. Out yields Kopu II. Some clover root weevil tolerance. Suited for dairy or rotational grazing beef systems.	
Weka	ML	3-5	500	Medium-High	Spring to Mid-Autumn	3+	Medium-large leaved cultivar. Has erect growth habit with very high stolon density and improved tolerance to clover root weevil. Suited for most grazing systems.	
Reisling	ML	3-5	500	Medium-High	Spring to Mid-Autumn	3+	Medium-large leaved type. High stolon density. Susceptible to clover root weevil.	
SF Quest	ML	3-5	500	Medium-High	Spring to Mid-Autumn	3+	Medium-large leaved cultivar with good frost tolerance and winter growth. Some tolerance to clover root weevil.	
Grasslands Tribute	ML	3-5	500	Medium-High	Spring to Mid-Autumn	3+	Medium-large leaved cultivar with some tolerance to clover root weevil. Medium to high stolon density. Has shown good persistence under hard sheep grazing. Suited for most grazing systems.	
Apex	M	3-5	500	Medium-High	Spring to Mid-Autumn	3+	Bred for improved stolon growing points and greater persistence under drier conditions. Good tolerance to clover root weevil. Good resistance to pepper spot, clover rot, and leaf rust. A useful cultivar under sheep grazing.	
Grasslands Bounty	M	3-5	500	Medium-High	Spring to Mid-Autumn	3+	Medium leaved type with improved autumn growth, high stolon density and excellent persistence. Performs best under rotational grazing, but can be set stocked. Susceptible to clover root weevil.	
Grasslands Huia	M	3-5	500	Low-Medium	Spring to Mid-Autumn	3+	Medium leaved cultivar. Huia was first produced in 1957. Now superseded by Demand and Prestige. A sheep/beef type.	
Grasslands Demand	M	3-5	500	Low-High	Spring to Mid-Autumn	3+	Medium leaved cultivar which was bred for improved persistence. It has superior spring to summer yield compared to Huia and long more densely branched stolons. Has good tolerance of most leaf diseases. High levels of Nitrogen fixation. Performs well under cool moist conditions. An ideal general purpose type for dairy, sheep, cattle and deer.	
Aberdance	M	3-5	500	Low-High	Spring to Mid-Autumn	3+	Medium leaved type. Winter hardy so performs well under cooler moist conditions. Suited for sheep, cattle and deer under set stocking through to intensive rotational grazing.	
Grasslands Prestige	SM	3-5	600	Low-High	Early Spring to Mid-Autumn	3+	A small-medium leaved early flowering cultivar bred in Northland for improved winter activity in warmer climates. High stolon density. Good field tolerance to clover flea, stem nematode, and pepper spot. Performs well under dry, close grazed, hill sheep/beef/deer conditions. Suited for summer dry dairy farms.	
Grasslands Nomad	SM	3-5	600	Low	Late Spring to Mid-Autumn	3+	A small-medium leaved type. Very high stolon density. Bred for increased stolon recovery after dry summers. Suited for dryland set stocked grazing systems.	
Grasslands Tahora II	S	3-5	600	Low	Late Spring to Mid-Autumn	3+	Small leaved, very high stolon density, prostrate cultivar. Suited to moist hill country set stocked systems. Has good drought tolerance and persists well under close grazed set stocked systems.	
Aberace	VS	3-5	600	Low	Late Spring to Mid-Autumn	3+	Very small leaved type, with a dense network of stolons. Suitable for use under set stocked sheep pastures.	

OTHER LEGUMES Seed is best shallow sown and all must be inoculated with specific rhizobial strains for successful establishment. Generally they provide very high feed quality.

Cultivar	Sowing Rate in kg/ha		Minimum Annual Rainfall (mils)	Soil Fertility	Seasonal Growth Peaks	Persistence in Years	COMMENTS
	Alone	Mixture					
Caucasian Clover (<i>Trifolium ambiguum</i>)	2-5	1-2	500	Medium to High	Spring to Summer	5+	A very slow establishing, strongly rhizomatous, tap rooted, perennial legume. Once established caucasian clover offers strong spring and summer growth and is very tolerant of grass grub attack. Winter dormant. Under drought conditions it becomes dormant to persist.
Palestine Strawberry Clover (<i>Trifolium fragiferum</i>)	3	1-1.5	700	Low to Medium	Spring	5+	The most widely sown in Australia. It originates from an ecotype near the Dead Sea in Israel and was introduced in 1929. It is a vigorous, large leaf variety with good production in spring and summer and fair winter growth.
Alsike Clover (<i>Trifolium hybridum</i>)	1.5-3	1-2	600	Low to Medium	Spring to Autumn	2+	A lower yielding species generally used in tussock hill country under wet, cold, acid, and low fertility soil conditions. It will tolerate hot dry conditions under lax grazing. Persists under very cold conditions. Mix with cocksfoot and perennial ryegrass.
Enrich Persian Clover (<i>Trifolium resupinatum ssp majus</i>)	6-8	3-5	600+	Medium to High	Early Autumn to Late Spring	1	Very late flowering type with increased forage yields in late spring to early summer. Excellent tolerance to wet conditions, significantly out-yields sub clovers in wet years in waterlogged paddocks. Tolerates mild soil salinity.
Lightning Persian Clover (<i>Trifolium resupinatum ssp majus</i>)	6-8	3-5	600+	Medium to High	Early Autumn to Late Spring	1	A soft seeded, highly productive annual legume with strong spring growth. Suits moderate to high rainfall areas or where irrigated. Suits clay soils with a pH between 5.5 and 7.0. Performs best with mild winters.
Bolta Balansa Clover (<i>Trifolium balansae</i>)	6-8	3-5	600	Medium to High	Winter to Spring	1	A self regenerating annual that survives by producing large amounts of hard seed. Bolta is a late flowering, hollow stemmed, semi-prostrate cultivar with low levels of formononetin. Most growth occurs in the cooler months through to spring. Tolerant to waterlogging. Good for hay.

FORAGE HERBS Are generally used as an additive to pasture mixes, but may be used to provide specialised summer autumn finishing feeds in mixtures with grasses such as timothy. They are generally deeper rooted and heat tolerant and can provide high quality beneficial feed to the grazing animal.

CHICORY: Chicory is a summer active, highly palatable perennial herb which is regarded as a valuable addition to most pasture seed mixes. Chicory has broad leaves and a long thick tap-root with an exposed crown. The crown regenerates shoots which in turn develop their own roots. This crown can be damaged by heavy winter treading and over-grazing. Chicory will tolerate a wide soil pH range but grows best in a range of pH 5.5 - 6.0. Chicory is often used to help prevent summer root pulling of ryegrass based pastures. Chicory is best shallow sown and when soil conditions are warm. When used in finishing mixtures chicory should always be sown with a suitable legume such as red and white clovers.

PLANTAIN: Plantain is a palatable, mineral rich perennial herb with a deep fibrous root system enabling good heat and drought tolerance and which is generally recommended for use in lower fertility dryland pasture mixes. It is slightly tolerant to grass grub damage and will tolerate low phosphorus and potassium soils and grows within a broad soil pH range of 4.2 - 7.8. It will not tolerate swampy soils. Often used with chicory for use in deer mixtures. It has nearly twice the uptake of Selenium and triple that of Copper compared to ryegrass and provides higher levels of Calcium, Sodium and Zinc in the diet to the grazing animal.

Cultivar	Sowing Rate in kg/ha		Minimum Annual Rainfall Approx mm	Soil Fertility	Seasonal Growth Peaks	Persistence in Years	COMMENTS
	Alone	Mixture					
Chico chicory	6-8	1-2	500	Medium-High	early spring to mid autumn	2-3	Chico is a cool season active chicory with very high summer yield potential. Chico has an upright growth habit and wide leaves. It is noted for its fast establishment and is widely used in areas prone to occasional summer dry to provide highly digestible feed. Lower growing point than Grouse.
Grasslands Choice chicory	6-8	1-2	500	Medium-High	Spring to Autumn	2-3	An erect winter active cultivar bred for improved cool season growth, disease tolerance and recovery after grazing.
Grasslands Puna II chicory	6-8	1-2	500	Medium-High	Spring to Autumn	2-3	A New Zealand bred, broad leaved, winter dormant but summer active cultivar bred for improved perenniality. Has high nutritional quality, producing high yields from spring to late autumn
Grouse Chicory	6-8	1-2	500	Medium-High	mid spring to late autumn	2-3	A very upright, cool season active chicory with high summer yields and which grows well into late autumn if soil moisture is sufficient. Displays large uniform sized leaves.
SF Punter Chicory	6-8	1-2	500	Medium-High	mid spring to late autumn	2-3	A high yielding, perennial forage chicory selection with improved establishment vigour.
501 Chicory	6-8	1-2	500	Medium-High	mid spring to late autumn	2-3	A new cultivar which has shown excellent DM yield. It was selected for an erect growth habit providing high utilisation, and low crown to reduce susceptibility to treading damage and Sclerotinia.
SF Boston plantain	8-10	1-2	500	Medium-High	mid spring to late autumn	3	Remains vegetative longer into the summer months due to late flowering (4 weeks later than Tonic). Small seed size allowing low sowing rate. Erect type with broad leaves and dark green in colour. Rapid to establish. Boston is suited to high producing pastures and also suits drier regions and less fertile conditions. Boston is suitable for both rotational grazing and set stocking.
Ceres Tonic plantain	8-10	1-2	500	Low to High	Flattened growth curve	3	Tonic is a summer active cultivar displaying strong autumn to winter growth. It is very erect, with a very large leaf size and medium tiller numbers. Shows rapid establishment. Tonic is highly preferred by cattle, but is also acceptable to other grazing animals.
Tuatara plantain	8-10	1-2	500	Medium	Flattened growth curve	3	Tuatara is recommended for a range of soil fertility, soil types and climatic zones.

RED CLOVERS A short-lived, tap-rooted legume used in pasture mixes to provide high quality summer forage. Flowers later than white clover. May persist 2-4 years in mixed pastures and up to 5 years under favourable conditions. Performs best under low stocking rates, long summer rotations, or hay production. Red clovers contain phyto-oestrogens (formononetin) so should not be fed as a pure sward to breeding stock immediately prior to and during mating. The phyto-oestrogens help the plant tolerate insects (eg grass grub, black beetle) and leaf disease (eg pepper spot) attack. Highly preferred by deer. Tetraploid types usually have larger leaves but larger florets causing difficulty with pollination, leading to poorer seed set and poor re-establishment by seed. Spreading types need lax grazing to allow development of daughter plants from horizontal stems. Mixes well with specialist herbs such as Chico chicory.

Cultivar	Leaf size : L = large, ML = medium/large, M = medium, S = small, VS = very small	Sowing Rate in kg/ha (bare equivalent)		Minimum Annual Rainfall (mils)	Soil Fertility	Seasonal Growth Peaks	Persistence in Years	COMMENTS
		Alone	Mixture					
Malbec	L	4-6	2-3	600	Medium-High	Autumn & Spring	3-6	Large leaved upright type, with low oestrogen levels. Very good winter and spring growth. Recommended for beef, sheep and dairy pastures, sown alone or in a pasture mix. Also suitable for hay and silage
SF Rossi	L	4-6	2-3	600	Medium-High	Spring to Autumn	3-7	Early flowering cultivar bred for persistence under rotational grazing. Strong tap root and medium to large leaf size.
Grasslands Pawera	L	5-8	4-6	650	Medium-High	late Spring to Autumn	3-6	Late flowering, erect, tetraploid grazing or hay type with higher phyto-oestrogen levels. Large leaf size. Winter dormant. Good drought tolerance. Sow at 10-12 kg/ha if used solely for hay production.
Grasslands Relish	L	4-6	2-3	650	Medium-High	late Spring to Autumn	3-6	A more persistent, semi-prostrate growth habit. Lower oestrogen type. A good replacement for Colenso and Sensation. Suitable for cattle grazing.
Grasslands Hamua	ML	4-6	2-3	600	Medium-High	Spring to Autumn	2-3	Also known as "Broad Red" or "NZ Cow Grass". An older, early flowering diploid dairy pasture type. Higher phyto-oestrogen levels. Medium to large leaf size. Low stem density. Less persistent than other red clovers.
Grasslands Sensation	ML	4-6	2-3	600	Medium-High	Spring to Autumn	3-7	Very early flowering (2 weeks earlier than Colenso), diploid, hay or pasture type. Very erect. Medium phyto-oestrogen levels. Medium leaf size. Tolerance to clover root weevil. Good early season growth. Will naturally re-seed within a pasture sward.
Tuscan	M	4-6	2-3	600	Medium-High	Spring to Autumn	3-7	An early flowering medium leaf size diploid cultivar bred for improved persistence under sheep grazing. Good summer and autumn yields. 20% higher in phyto-oestrogen than Grasslands Colenso so should not be grazed during mating. Susceptible to sclerotinia.
Rajah	M	4-6	2-3	600	Medium-High	Spring to Autumn	3-7	A diploid intermediate to late flowering cultivar bred in Denmark. Good winter hardiness. Lower phyto-oestrogen levels.
Grasslands Colenso	M	4-6	2-3	600	Medium-High	Autumn & Spring	3-6	An early flowering diploid, more persistent broad red cultivar with good winter activity and good stem density. Medium-low phyto-oestrogen levels. Medium leaf size. General use in most pasture mixes but also a good companion to the brome grasses. Shows good heat tolerance.

SUBTERRANEAN CLOVER These are annual clovers mostly suited to acid soils for use in areas of low rainfall with dry summers. Seed is buried under the soil surface and regenerates with autumn rains. Part of the seed set contains hard seeds. Some of these seeds will germinate one or two years later than most. This helps protect the plant from 'false strikes' where early germination is followed by drought and loss of seedlings. Sub clovers are resistant to clover root weevil. Late heading cultivars give better spring growth. In the first year maximum seed yield by de-stocking at flowering until growth has dried off. After germination de-stock until lateral roots are running. Where rainfall is variable from late October to December, it is a useful strategy to sow an earlier cultivar such as Woogenellup with a later one, like Leura. The pasture should then be better able to exploit both dry and wetter seasons.

Cultivar	Sowing Rate in kg/ha		Minimum Annual Rainfall (mils)	Soil Fertility	Seasonal Growth Peaks	Persistence in Years	COMMENTS
	Alone	Mixture					
Antas	10-15	6-10	650+	Low to Medium	Spring & Autumn	1	Belongs to the sub species <i>Brachycalycinum</i> , and is a black seeded sub clover. Is a high yielding, mid season maturing cultivar with excellent herbage production which is suited to a wide range of soil types but grows best at a higher pH in more free draining soils. Moderate resistance to pythium and fusarium.
SF Campeda	6	4-6	650+	Low to Medium	Spring & Autumn	1	A mid season maturity cultivar, with some disease tolerance. Graze until flowering then reduce stocking rate to promote seed set.
Coolaman	6	4-6	650+	Low to Medium	Spring & Autumn	1	A mid season flowering, winter active cultivar with high seedling regeneration and hard seeded content to provide a large seed bank for subsequent years.
Denmark	6	4-6	600+	Low to Medium	Spring & Autumn	1	A cool season active, late heading, low oestrogen type. Has low levels of hard seed. Has resistance to clover scorch, phytophthora root rot and pythium. Tolerates heavy grazing.
Goulburn	6	4-6	550+	Low to Medium	Spring & Autumn	1	A cool season active, late heading, low oestrogen, prostrate type. It produces a very high seed yield and has high levels of hard seed to aid persistence. Resistant to clover scorch, leaf rust and phytophthora root rot.
Leura	6	4-6	650+	Low to Medium	Spring & Autumn	1	A cool season active, late heading, low oestrogen type. Has low levels of hard seed. Has resistance to leaf rust, clover scorch, powdery mildew, phytophthora root rot and claudetia. Resistant to stem nematode.
Monti	10-15	6-10	650+	Low to Medium	Spring & Autumn	1	Belongs to the sub species <i>Yanninicum</i> , and performs well in areas that are low in pH and prone to intermittent water logging. Monti is the earliest maturing cultivar of this type. Has relatively large white coloured seed (146,000 seeds/kg).
SF Rosabrook	6	4-6	650+	Low to Medium	Spring & Autumn	1	A late flowering, black seeded cultivar suited to areas where the season will continue to mid-late November. Is adapted to moderately acid to neutral soils and has improved resistance to phytophthora and kabatella.
Woogenellup	6	4-6	650+	Low to Medium	Spring & Autumn	1	A mid season maturity soft seeded cultivar. Black seeded with low levels of hard seed.

LUCERNE Lucerne is an erect growing, tap rooted perennial, generally grown in pure stands for sheep, cattle, horse, and deer grazing or hay production. Prefers well drained neutral soils of pH 5.6 or greater, and is intolerant of waterlogging. Winter active varieties should be used in warmer climates and can produce 20% of their growth during winter months but tend to have a shorter stand life of 3-4 years. Semi-dormant cultivars produce 5-10% of their growth in the winter and under good management may have a stand life of 5-7 years or more. Winter dormant cultivars produce little or no winter growth but tend to have the longest stand life with a lower crown making them more suitable to grazing. Avoid sowing lucerne into areas with an immediate pre-history of red clover, chicory, potatoes or onions as these crops can act as a host crop to *Sclerotinia* (stem rot). Ideal sowing depth should be 6-12mm at 12-18 kg/ha using seed freshly inoculated with Group A *Rhizobium* inoculum.

A = Active, SA = Slightly Winter Active, SD = Semi Dormant, D = Dormant, S = Susceptible, MR = Moderate Resistance, R = Resistant, HR = Highly Resistant.

Variety	Pest and Disease Resistance								Soil Fertility	Peak Production	Sowing Rate (kg/ha)	Persistence (Years)	Comments
	Winter Dormancy	Blue Green Aphid	Pea Aphid	Spotted Aphid	Stem Nematode	Bacterial Wilt	Phytophthora	Leaf Diseases					
WL325HQ	SD	R	R	R	MR	R	R	R	Med-High	Late Spring - Autumn	12-15	5-7	WL325HQ supersedes WL322HQ, with increased herbage quality and a greater harvest window.
Grasslands Kaituna	SD	R	R	R	R	R	R	MR	Med-High	Spring - Autumn	12-15	5-7	Bred from New Zealand and American germplasm. Fine stemmed. Highly persistent. A general purpose variety. Consistent performer throughout the North Island.
SF Force 4	SD								Med-High	Spring - Autumn	8-12	5-7	Excellent cold and drought tolerance. Shows good early season growth and good persistence. Multi-stemmed with upright growth habit. High leaf to stem ratio.
Rhino	D	R	R	R	R	-	-	-	Med-High	Late Spring - Summer	8-12	5-8	A fine stemmed variety with a low crown, reducing grazing/cutting damage.
Supersonic	A	HR	R	R	-	MR	HR	-	Med-High	Late winter - Summer	12-15	3-4	Highly winter active with strong spring and autumn growth and improved leaf to stem ratio.
Icon	SA	HR	R	HR	-	MR	HR		Med-High	Early Spring - Autumn	12-15	4-6	A dual purpose early flowering variety bred for increased pest and disease resistance. Has low crowns which can better tolerate sheep grazing.
Wairau	D	S	S	S	S	S	S	S	Med-High	Summer	12-15	3-6	A NZ bred, winter dormant variety. Susceptible to all major pests and diseases. Use in favourable environments or as a short term stand.
Stamina 5	SD								Med-High	Spring - autumn	12-15	5-7	Bred for increased persistence, enabling it to tolerate set stocking and close grazing. Produces excellent hay quality.
Grasslands Torlesse	D	HR	-	R	R	MR	R	R	Med-High	Spring - Autumn	8-12	5-8	A highly persistent winter dormant NZ bred variety. It is high yielding and has good resistance to most pests and diseases.
Runner II	D	-	-	-	-	R	S	-	Med-High	Late Spring - Summer	8-12	5-8	A stoloniferous variety more suited to grazing rather than to forage production. It is fine stemmed and has high quality forage. A <i>Medicago falcata</i> species.
Pioneer 54V09	D		HR	R	HR	HR	R	R	Med-High	Spring - Autumn	8-12	5-8	A high yielding, winter dormant variety with high forage quality. High resistance to insect attack and disease. Low crown makes it suitable for grazing as well as high quality baleage or hay.

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