Grasslanz is a plant technology provider. Its products are proprietary cultivars, grass endophytes, and outputs from plant biotechnology and genomics research. These technologies are licensed to seed companies who deliver them primarily through seed to our end users, who are farmers. Grasslanz works with an international network of investors and research organisations to develop innovative new products. As part of the world-recognised AgResearch Group, Grasslanz benefits from the considerable resources and scientific reputation of its parent organization. It is able to draw on seven decades of research history and the skills and knowledge of over 600 scientists.

**Products and services:**
- Funding, development and licensing of pasture cultivars, grass endophytes, other plant symbionts, and outputs from plant genomics
- Develop other value added products that are derived from or used with our existing seed products
- Collaborative research and project management of plant technologies
- Production and sale of high quality early generation nucleus seed
- Protection of intellectual property through Patents and Plant Variety Rights

**Grasslanz seeks partners who**
- are technology providers looking to share the risk and cost of product development through partnering
- are seed companies seeking access to novel germplasm, proprietary endophytes or transgenic traits
- are seed companies requiring high quality early generation seed production
- are technology providers requiring access to an international network of forage research providers, including AgResearch a world leader
- share our objective to capture value from unique plant opportunities.
WHITE CLOVER
(Trifolium repens)

White clover is an important temperate forage legume that is grown widely and performs well on soils that are moderate to highly fertile. A perennial legume, white clover has a network of stolons that are often below soil level in pastures. Death of old stolons enables new plant units to be formed, and the plant often reseeds itself over summer, which builds a valuable buried seed reservoir in the soil.

White clover fixes quite large quantities of nitrogen under favourable conditions and contributes essential protein to livestock diets.

LARGE-LEAVED

Grasslands Kopu II (Wrightson Seeds)
- Very large leaves with high carbohydrate levels.
- Thick stolons and high stolon density for enhanced persistence.
- Resistant to most foliar diseases.
- High year-round production particularly in winter.
- Suited to rotational grazing with beef and dairy cattle.

MEDIUM-LARGE-LEAVED

Grasslands Sustain (Peter Cates Limited)
- High stolon density with good winter growth.
- Suitable for intensive grazing by all classes of stock.

Grasslands Bounty (Wrightson Seeds)
- Cool season active with good stolon density.
- A good multi-purpose cultivar.

Grasslands Emerald (Agricom)
- Developed for drought resistance in Victoria, Australia.
- Year-round growth, particularly winter-spring.
- High stolon density for persistence.
- Suited to grazing by dairy cattle.

Grasslands Tribute (Agricom)
- Developed for Victoria, Australia.
- All purpose white clover for dairy and sheep management systems
- Medium stolon density. Year-round growth. Good persistence
- Good levels of disease tolerance
- Suited to grazing by sheep.

Makuri (Barenbrug)
- Developed for the European market.
- High yield.

Milton (Barenbrug)
- Developed for the European market.
- High yield.
Barblanca (Barenbrug)
• Developed for European and UK markets.
• Improved winter and spring early growth.
• Suitable for grazing by all types of stock.

Triffid (Barenbrug)
• Developed for the European market.
• High yield.

Grasslands Patriot (Penningtons/Agricom)
• Developed in partnership with University of Georgia.
• Patriot is a hybrid between naturalised ecotypes and a virus-resistant Ladino.
• Persistent, high yielding, densely spreading, profusely flowering cultivar.

Saracen (Agricom)
• Jointly developed with NSW Agriculture.
• Medium stolon density
• Exhibits very strong persistence and growth under cattle and dairy grazing.

Trophy (Agricom)
• Jointly developed with NSW Agriculture.
• Exhibits very strong persistence and growth under grazing.
• Medium stolon density
• Good drought tolerance

Quest (Seedmark/Seedforce)
• Selected for excellent spring and autumn growth under sheep grazing.
• High stolon density and good tolerance to clover root weevil.

MEDIUM LEAVED

Grasslands Nomad (Agricom)
• Developed for drought resistance.
• High stolon density with good spring-summer growth.
• Suited to grazing by sheep.

Crusader/Apex in New Zealand (Barenbrug/NZ Agriseeds)
• Selected for drought tolerance and high stolon density.
• High producing with good winter-spring activity.
• Resistant to foliar diseases, leaf rust, pepperspot and Sclerotinia.
• General-purpose, suited to a wide range of farming systems

Durana (Penningtons/Agricom)
• Selected from naturalised ecotypes in Georgia for increased persistence.
• Persistent, low-growing, densely spreading, profusely flowering cultivar.
Aqilles (Gentos)
- Selected from ecotypes collected in Argentina
- High stolon density, good persistence
- Well suited to cattle grazing systems
- Excellent seed production

**MEDIUM-SMALL LEAVED**

Grasslands Demand (Cropmark)
- Suited to cool-temperate conditions and has very good spring-summer growth.
- Tolerates leaf disease such as rust and sooty blotch.
- General-purpose cultivar with good stolon density and performs well under set stocking.

Grasslands Prestige (Agricom)
- Bred for warm temperate environments, it has excellent winter and spring growth in warm situations.
- Tolerant to clover flea, stem nematode and rust disease.
- Very high stolon density, it is suitable for use under set stocking.

Resolute (Allied Seeds)
- Selected from naturalised ecotypes for increased persistence under grazing and drought stress in SE USA.
- Small to medium leaf, low cyanogenic level.

- High stolon density.

GC133 (Pennington Seed)
- Sold in the USA wild life market.
- Medium leaf, with good stolon density.
- Persistent under grazing and summer drought conditions.
- High cyanogenic levels.

**SMALL-LEAVED**

Avalon (Barenbrug)
- Small-medium leaf with high stolon density and good disease resistance.
- Excellent performance and persistence under cutting.

Tahora II (Wrightson Seeds)
- Small-medium leaved, high percentage of genotypes are cyanogenic.
- High stolon density.
- Persistent, suitable for use under set stocking and intensive rotational sheep grazing.
- Good spring/summer performance.
RED CLOVER
(Trifolium pratense)

A shorter-lived legume than white clover, but giving high forage yields when rotationally grazed. The plant is tap-rooted with dull, hairy foliage, which usually bears a distinct leaf-mark. Later flowering than white clover, red clover has large flowerheads, which are pollinated by bumblebees.

In general, the plant has no creeping stems and does not readily reseed, making good establishment vital for subsequent performance. However, in recent years, selections exhibiting various degrees of “creepiness” have been developed.

Red clover is an excellent plant for use in fertile pastures. Mixed with grasses, other legumes and grazing herbs, it provides important quality forage over the summer-autumn period. It conserves well as silage and hay. The species is highly preferred by deer, but acceptable to all stock. A major criticism of red clover has been its oestrogen effects on ewe fertility, but this has now been addressed with the breeding of new varieties with low to medium oestrogen levels.

Grasslands Colenso (Agricom)
• Diploid early-flowering selection bred from Hamua x Moroccan ecotype.
• More persistent and productive in autumn and winter than Hamua.
• Suitable for use in dryland areas.
• Medium formononetin (oestrogen) levels.
• Tolerates Sclerotinia disease.

Grasslands Sensation (Agricom)
• Erect, disease-tolerant selection, suitable for dry regions, especially under lax grazing.
• Cool-season active and early flowering.
• Diploid cultivar, with moderately low levels of formononetin (oestrogen).

Grasslands Broadway (Agricom)
• Prostrate and small-leaved, longer and less dense branching.
• Spreads horizontal soil surface stems that root to ground in moist soils.
• Potentially high forage yield. May be less persistent under intensive grazing or grass competition.
• Low in formononetin (oestrogen).
• Prolific flowering, but only low to medium seed set.
LOTUS (*Lotus uliginosus* syn. *L. pedunculatus*)

A perennial five-leaved legume that thrives in wet, acidic, infertile situations under lighter grazing pressure, and performs as a pioneer legume for pasture development. Now widely used in agroforestry situations because it tolerates shade and needle litter better than clover.

It contains condensed tannins, so is non-bloating to animals. The tannins also protect forage proteins in the rumen from degradation, enhancing amino-acid digestion, which results in leaner meat and more wool. The plant is also resistant to grass grub and porina caterpillar. Recent research indicates that condensed tannins also minimise intestinal roundworm effects and reduce incidence of daggy wool and flystrike in sheep. Lotus requires a specific *Rhizobium* strain for nitrogen fixation, which should be bought with seed and added just before sowing.

Grasslands Trojan (*Agricom*)

- Spreading, rhizomatous, tetraploid cultivar suitable for low fertility, moist, acid soils.
- Good levels of winter growth.
- Suitable for agro-forestry, temperate high country and summer-wet subtropical sites.
- Superior seedling vigour and establishment.
OTHER LOTUS
(Lotus corniculatus and Lotus tenuis)

Birdsfoot trefoil, the other major Lotus perennial, resembles lucerne in its use and management. However, it thrives in less fertile, more acidic situations than lucerne.

An erect five-leaved plant with paler green succulent foliage, its yellow florets mature to form a seedhead resembling a bird’s foot, hence the common name. Generally branching from a basal crown in a similar manner to lucerne, recent selections with creeping rhizomes similar to Maku lotus have been made.

The species has strong tap-roots and tolerates drought well. It needs much less fertiliser than lucerne. It can be sown alone or mixed with non-aggressive forage species. Establishment is slower than lucerne, so the stand requires careful and lax management during the first year. It requires a specific Rhizobium strain for nitrogen fixation, which is supplied with the seed.

Birdsfoot trefoil has condensed tannins, which confer non-bloating qualities to its forage. The condensed tannins also appear to minimise roundworm effects in livestock, reduce the incidence of daggy wool and flystrike in sheep, and enhance protein digestion.
LUCERNE (Alfalfa)  
*(Medicago sativa)*

An erect-growing, drought-tolerant perennial legume used widely in both temperate and tropical grasslands in many countries. Grown in pure stands, lucerne requires high fertiliser and pesticide application to perform well in New Zealand.

Lucerne’s leaves are trifoliate with the central leaflet having an extended stalk and midrib tip. Growth habit is erect from a basal crown. The species does not reseed itself easily or spread by rhizomes - creeping types developed overseas had limited success to date.

Recent cultivars have resistance and tolerance to several pests and diseases, helping overcome on-farm problems. Lucerne is sown at 10 kg/ha and establishment can be a problem in some regions.

**Grasslands Kaituna** *(Wrightson Seeds)*
- Multiple disease- and pest-resistant cultivar.
- Intermediate in dormancy, having more late-autumn and early-spring growth than Wairau.
- Resistant to blue-green aphid, pea aphid, spotted alfalfa aphid, stem nematode, *Fusarium* wilt, bacterial wilt, *Phytophthora* root-rot and *Colletotrichum* crown rot.
- Has proved to be very persistent in trials under both cutting and grazing management in New Zealand and Tasmania, Australia.

**Grasslands Torlesse** *(Agricom)*
- General-purpose cultivar bred for increased productivity from New Zealand and North American material.
- High spring and summer growth.
- Improved pest and disease resistance, particularly blue-green aphid and stem nematode.
**STRAWBERRY CLOVER**
*(Trifolium fragiferum)*

A prostrate perennial legume that thrives in saline soils, its foliage looks similar to white clover as it has prostrate, branched, creeping stolons, and small trifoliate leaves. However, its small clover-type flowerheads are usually pink and resemble strawberry fruits. It may have potential as a perennial forage legume for heavily irrigated farm systems.

**Grasslands Lucila** *(PGG Wrightson)*
- Selected in Argentina from a local ‘common’ population and New Zealand cultivar.
- Palestine type with erect growth and medium-large leaves.
- Good winter growth, early flowering.
**SULLA**  
(*Hedysarum coronarium*)

Sulla is a short-lived perennial legume with erect, succulent, pinnate leaves and red/crimson flowerheads. Occurring naturally in the Mediterranean region, sulla has been cultivated widely there, and in recent times, it has been introduced as a conservation and forage plant in New Zealand and Australia.

Sulla has a strong, branched tap-root system. Its foliage is strong and mostly upright, growing 60 to 150 cm in height. It has large compound leaves with oval to round leaflets arranged in pairs, and a single terminal leaflet.

Its major attributes include high yields of cool-season very palatable forage, with relatively high rates of nitrogen fixed during its growing season. It contains condensed tannins in foliage and stems. Sulla prefers soils with a higher pH than that required for clovers.
**ALSIKE CLOVER**
*(Trifolium hybridum)*

A short-lived perennial that looks midway between red and white clovers. Unlike red clover it has hairless leaves without any leaf marking, but it also lacks the creeping stolons of white clover.

Alsike clover tolerates less fertile acid and alkaline soils, and performs well in wet soils under cold conditions. In New Zealand it has value for oversowing in tussock country.

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**Grasslands Polar (Seedmark)**

- A legume adapted to the shorter growing season and cold winters.
- A growth habit similar to red clover. Prolific reseeding helps to maintain stand.
- Tolerant of acid, low-moderate fertility soils and areas with greater than 500 mm rainfall.
- Excellent for use as hay or for grazing.
PERENNIAL RYEGRASS
(Lolium perenne)

A dark green, hairless and glossy plant, perennial ryegrass has fine leaves and tillers well. The leaf bases are usually dark red. The ligule and auricles are short and inconspicuous. Seed-heads are produced in abundance in spring, with flattened spikelets alternating up the head, and without awns. Seeds are fawn in colour, flat and also awnless.

Perennial ryegrass contains a ‘live-in’ fungus, or endophyte, which produces alkaloids. One of these alkaloids, peramine, gives the plant resistance to Argentine stem weevil and some other pests. However, another endophyte alkaloid, lolitrem B, causes ryegrass staggers in grazing animals, and a third alkaloid, ergovaline, causes heat stress by restricting blood circulation. These animal disorders usually occur during late summer, but the endophyte alkaloids are known to survive in forage conserved as hay. The selected endophyte strain AR1 is free of the alkaloids lolitrem B and ergovaline that impair livestock health and productivity, but does produce peramine so will provide effective protection against Argentine stem weevil. It will provide some protection against black beetle attack, but will not be as effective as that provided by the common wild-type endophyte.

The most recent endophyte AR37 does not contain the alkaloids lolitrem, peramine, or ergovaline, but does produce compounds called epoxy-janthitrems. These confer a wide range of tolerance to insect pests (Argentine stem weevil, black beetle, root aphid, pasture mealy bug, and porina). To date testing has shown AR37 to be more agronomically robust than standard endophyte with similar animal performance levels as AR1. While AR37 does not produce lolitrems or ergovaline, some mild ryegrass staggers have been observed for brief periods.

Grasslands Pacific/Grasslands Lincoln in Australia (Wrightson Seeds)
• Bred from selections within Ruanui and incorporating material from Spain and Italy.
• Shows good persistence through the dry season and good autumn-winter growth.
• Tolerant to crown rust disease.
• Nil- and high-endophyte lines are available.

Grasslands Samson (Agricom)
• Suitable for use as a general-purpose perennial ryegrass in pasture mixes.
• Significantly lower levels of rust infection than other commonly available perennial ryegrasses.
• Persists extremely well in difficult environments.
• AR1 available.
**Grasslands® Fitzroy (Wrightson Seeds Australia)**
- Derived from New Zealand germplasm and selected in Victoria, Australia.
- Developed for high rainfall areas and intensive fertilizer and grazing management, where it has excellent herbage yields and disease resistance.
- Good autumn and winter growth, strong spring to early summer growth.

**Grasslands® Commando (Agricom)**
- Bred from persistent plant types collected from a warm temperate environment.
- High levels of dry matter production, with improved cool and warm season growth.
- Excellent disease tolerance.

**Grasslands® Hillary (Agricom)**
- Fine-leaved, densely tillered perennial ryegrass.
- Tolerant of hard grazing and lower fertility environments.
- Excellent persistence.
- Good levels of dry matter production.

**Grasslands® Kamo (Wrightson Seeds)**
- Bred from ecotypes collected from Northland sheep and beef farms subjected to wet winters and summer moisture deficits.
- Tolerant of leaf rusts
- Persistent perennial ryegrass well suited to sheep and beef grazing management
HYBRID RYEGRASS
*L. hybridum*

A world first for Grasslands in the late 1940s, hybrid ryegrass breeding has progressed to combine the best features of both parents in new hybrid cultivars. These range from types that resemble Italian ryegrass in their high yield of large-leaved forage, persisting for up to four years, to types as persistent as perennial ryegrass.

Grasslands Impact *(NZ Agriseeds)*
- Developed from late-heading material out of Nui and introduced material from northwest Spain.
- Late-flowering selection, three weeks later than Nui.
- Persists as well as perennial ryegrass.
- Excellent winter growth and high summer-autumn yields where moisture permits.
- Produces high quality herbage in late spring-early summer, and has a low level of aftermath heading.
- Outstanding resistance to crown rust and good tolerance to stem rust.
- ARI available.

Grasslands Marsden *(McCaw Seeds)*
- Persistent hybrid ryegrass selected for low leaf strength and low cellulose to provide superior palatability and improved intake.
- Good tolerance to crown rust.
- Herbage production consistently compares well with top perennial ryegrasses in three-year trials, except under severe summer stress.
- ARI available.

Grasslands Supreme PLUS *(Agricom)*
- Developed from persistent hybrid material after evaluation throughout New Zealand, particularly in the southern South Island.
- Superior all-year-round growth.
- Excellent disease resistance.
- Excellent persistence under fertile summer-moist conditions.
- ARI available.

Grasslands® Ohau *(Agricom)*
- High levels of dry matter production.
- Tetraploid hybrid ryegrass with very high level of forage quality.
- Excellent winter growth.

Grasslands Sterling *(Agricom)*
- Long rotation ryegrass.
- Later flowering.
- Excellent early-spring growth.
- High level of forage quality.
- Good persistence compared with tetraploid hybrid ryegrasses.
ITALIAN RYEGRASS  
*(Lolium multiflorum)*

An erect, large-leaved succulent ryegrass, which produces heavy yields of quality forage for up to three years. Tillsers are rounded and its auricles are well developed. Flower-heads and seeds are similar to those of perennial ryegrass but bear long awns.

Westerwolds ryegrass is an annual type within the species (named from the Dutch province where it arose) that has high value between crops and for temporary cool-season feed. Unlike the other ryegrasses, Westerwolds ryegrass will produce abundant seed heads after a spring sowing.

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Grasslands® Warrior *(Agricom)*

- Bred in hot, moisture-stressed environment.
- Excellent disease tolerance, especially rust.
- Outstanding levels of dry matter production over a 12 month period.
- Has an extended spring-summer growth period.
- Excellent winter growth.
**COCKSFOOT (Orchard grass) (Dactylis glomerata)**

A persistent deep-rooted perennial grass with dull, flattened hairless foliage. It has a white ligule but no auricles. The panicle seedheads are clumpy. Seeds have an awn point and are curved, pale and smaller than ryegrass.

Cocksfoot is a valuable grass in drier situations of moderate fertility. It mixes well with perennial grasses like ryegrass, phalaris and tall fescue.

Recently introduced cultivars have good resistance to rust disease and the species has pest tolerance once established.

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**Grasslands Wana (Cocksfoot Growers)**
- Densely tillered cocksfoot suitable for hard continuous grazing, especially by sheep.
- More drought tolerant than ryegrass and does not cause ryegrass staggers.
- Slower to establish than ryegrass and sensitive to low soil temperatures.
- Resistant to rust disease.
- Excellent performance from oversowing on hill country. Tolerates low fertility soils.

**Grasslands Kara (Agricom)**
- Hybrid bred from crossing Apanui with a Portuguese cocksfoot (D. lusitanica), giving greater cool-season activity and a wider spread of seasonal production than other cocksfoot cultivars.
- Should be used as a component of pasture mixtures for quality summer feed. Very compatible with other grasses.
- Is rust free and does not cause livestock health problems.
- A tall, erect plant with low tiller density making it suited to controlled grazing systems on fertile lowland.
- Has excellent seedling vigour and more cold-tolerance than Grasslands Wana.
- Responds well to increased fertility.

**Grasslands Tekapo (Wrightson Seeds)**
- Densely tillered, prostrate cultivar suitable for hard grazing and dry environments.
- Is slightly finer and more densely tillered than Wana.
- Flowers two to three weeks earlier than Wana and Kara.
- Slightly less cool-season activity than Wana.

**Grasslands Vision (Cropmark Seeds)**
- Bred from hybrids between Wana and Kara.
- Contains characters of both parents, but is slightly less erect than Kara, and has shorter narrower leaves. More densely tillered than Kara, but less prostrate and lacks the bright green foliage of Wana.
- Intended for general pasture use, particularly dairy farming. Yields higher than both parents except in spring.
PHALARIS (Harding grass) \textit{(Phalaris aquatica)}

A large, flat-leaved, hairless perennial grass with stiff, blue-green foliage. The plant has no auricles but a prominent ligule and spreads by short creeping rhizomes. The flowerhead is a tall compact ‘pipe-cleaner’ panicle bearing oval and shiny seeds.

It should \textit{always} be sown in mixture with other grasses - ryegrass or tall fescue, cocksfoot or brome grasses, as it can be toxic as a pure stand (see note below).

Phalaris performs best in soils of good nitrogen fertility. It withstands hard grazing and treading once established, has excellent pest resistance and is known to reduce grass grub numbers in soil, helping to protect companion grasses and legumes.

It grows strongly during autumn and early winter, so can be included in mixtures with ryegrass (spring growth) and cocksfoot (summer-winter growth), or with tall fescue and clovers. Phalaris has excellent drought regrowth.

\textbf{Note}: Phalaris can cause staggers in grazing stock on cobalt-deficient soils such as volcanic ash in the Central Plateau, and on recent alluvial silt and stony loam soils. Check the cobalt soil status in low and marginal areas before sowing phalaris.

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Grasslands Maru (Agricom) check royalty sales with Dawn

- Resistant to insects such as grass grub and black beetle.
- Grows vigorously during the cooler part of the year, and tends to be dormant in hotter weather.
- Very persistent once established and will withstand hard grazing. However, care must be taken to avoid clover suppression.
- Best used in mixtures with other grasses such as tall fescue and cocksfoot. Is suitable as a companion species with lucerne.
- Strong regrowth from pure swards can produce phalaris staggers.
- Suitable for erosion control.
TALL FESCUE
_Festuca arundinacea - Schedonorus phoenix_

A broad-leaved perennial grass with dark green, hairless foliage that looks stiff and can feel harsh, especially in wild plants. Tall fescue has prominent auricles but no ligule. Its tall, open panicles produce seeds similar in size and appearance to ryegrass, which makes contamination of seedlots a problem.

Tall fescue is deep-rooted so persists well in dryland situations. It also withstands poor drainage and salinity. It requires high soil fertility and responds well to nitrogen.

Tall fescue should **not** be sown with ryegrass, as the rapidly establishing ryegrass dominates the young pasture and the tall fescue never effectively emerges to make a contribution. Requires care during establishment; spring grazing management must control rapid development. Tall fescue grows well in all seasons, especially summer and autumn. It is becoming increasingly popular as an alternative to ryegrass-based mixtures in drier regions and where subtropical grass ingress is an increasing problem. It provides a sward with a higher white clover content than perennial ryegrass.

Tall fescue can cause heat stress in animals owing to a 'live-in' fungus, or endophyte. This endophyte is also important for the persistence of tall fescue pastures. AgResearch developed MaxQ® and MaxP® endophyte to retain the advantages of pasture persistence, but eliminate the animal health problems. These novel endophytes are available in the USA and Australasia.

Grasslands Advance (Agricom)
- Suitable for a perennial grass base in difficult environments (grass grub, Argentine stem weevil, wet and dry soils, peat and saline soils).
- Once established gives a high annual yield similar to perennial ryegrass.
- Good palatability and digestibility.
- General-purpose summer pasture.
- Contains no endophyte, so does not cause animal health problems.
- Available with MaxP®.

Grasslands Flecha (Gentos/Agricom)
- Selected in Argentina from a French cultivar.
- Fine leaved and erect, with profuse heading.
- Excellent winter growth, summer dormant in dry regions.
- Contains no endophyte, so does not cause animal health problems.
- Available with MaxP®.
**GRAZING BROME (Bromus stamineus)**

A perennial grass from Chile, closely related to prairie grass but finer leaved, giving it good tolerance to close grazing. Grazing brome is best suited to medium to light land. It fails to persist on wet, heavy soils and when attacked by hessian fly, a cereal pest in the northern North Island, New Zealand.

Grazing brome has smaller but more numerous tillers than prairie grass, more hairs and longer awns. It produces divided panicle seedheads, and large seeds.

Grazing brome produces safe, palatable forage, giving good hogget live weights in all seasons. Its useful range includes the free-draining, less fertile soils of the East Coast of New Zealand, and light soils in other regions. It may be used as the sole grass component or with other suitable grasses such as phalaris, tall fescue and some cocksfoot types.

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**Grasslands Gala (Agricom)**

- More productive in late winter-early spring than perennial ryegrass.
- Drought tolerant, out yielding high endophyte ryegrass over summer.
- Good palatability provided it is not allowed to become too long and frosted in winter.
- Persistent under set-stocked management.
- Tolerates lower fertility soils compared with Grasslands Matua prairie grass. Avoid use in wet heavy soils.
- Similar animal performance to Matua.
- Mature stands have tolerance to Argentine stem weevil.
SMOOTH BROME  
(*Bromus inermis*)

A prostrate, perennial grass with broad leaves and few tillers, it spreads by rhizomes to give a thick persistent pasture that tolerates severe grazing.

This grass grows best in high country regions with cool winters and hot summers.

UPLAND BROME  
(*Bromus sitchensis*)

Tall, erect, broad-leaved brome grass, sparsely tillered and non-creeping. It has the potential to provide large quantities of nutritional forage in flat to rolling dry upland areas with cold winters and warm summers.

Grasslands Hakari (*Wrightson Seeds*)

- Winter dormant and spring-summer active.
- May not persist if grazed too frequently.
- Use fungicide-treated de-awned seed.
PRAIRIE GRASS
*B. willdenowii* syn. *B. catharticus*

A large-leaved, large-tillered, perennial grass from South America, it thrives on fertile free draining soils and has good drought tolerance. Prairie grass is densely covered in fine hairs and has a short ligule and no auricles. Unlike most other grasses, its loose panicle head is palatable to grazing stock. Seeds are very large and require fungicide dressing for protection against head smut disease.

**Grasslands Matua (HL Rosevar)**
- Good winter growth but also productive in other seasons if grazed and given adequate fertiliser.
- Seasonal growth pattern complements ryegrass pastures.
- Requires free-draining soils with high fertility, particularly nitrogen.
- Does not produce animal health problems such as ryegrass staggers.
- Well suited to silage and hay and palatable in all stages of growth.
- Use fungicide-treated de-awned seed.

**Lakota (Wrightson Seeds)**
- Selected for suitability in northern states of USA.
- Late maturing (about 1 week later than Matua).
- Semi erect and densely tillered.

**Grasslands Dixon (Wrightson Seeds)**
- Selected for suitability in southern states of USA.
- Good plant vigour.
- Intermediate growth habit and moderate tiller density.
TALL WHEATGRASS
(*Thinopyrum ponticum*)

Hardy, erect perennial bunchgrass introduced from southern Europe and Asia Minor. The greatest attribute of this grass is its capacity to produce forage in areas that are too alkaline or saline for other crops.

Is commonly used on range sites receiving 350-400 mm of annual rainfall, but at the same time have very good tolerance to wet conditions. It has good seeding vigour and established plants have an exceptionally deep root system which is largely responsible for its resistance to drought.
TIMOTHY
*(Phleum pratense)*

A grey-green perennial grass with rounded tillers, flat leaves and swollen, bulb-like tiller bases. The foliage is dull and hairless with a short ligule but no auricles where the leaf blade joins the sheath. Its flower-head is a spike-like ‘pipe-cleaner’ panicle, which has prominent awn points. Seeds are small, pale and rounded.

Late to start growth, timothy is not widely used in New Zealand, though it suits the cool-temperate regions of southern South Island, particularly moist heavy soils. Good for hay crops, otherwise tends to be a minor component.
CHICORY
*(Cichorium intybus)*

Chicory is a persistent, tap-rooted, leafy herb, producing high-quality summer forage that gives excellent animal production in lambs, deer and cattle. It has also provided valuable grazing for young racehorses on stud farms.

Suited to fertile free-draining soils and rotational grazing, chicory can be used in mixture with legumes only and as a component in standard grass-clover mixtures.

Its growth accelerates in spring, peaks over summer and early autumn and declines in winter. It is highly acceptable to all grazing stock.

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**Grasslands Puna** *(Wrightson Seeds)*
- Higher levels of important minerals than ryegrass, clovers and lucerne.
- Very high animal performance.
- Good tolerance to drought and summer heat.
- Perennial alternative to forage brassica crops if sown as pure stand (including clovers), but requires high fertility.
- Variable persistence, 3-5 years.
- Limited chemical weed control – best option is by topping or ‘wiping’ with a suitable herbicide.
- Good companion species with most grasses.

**Puna II** *(Wrightson Seeds)*
- More uniform in leaf shape than Puna.
- More cool-season tolerant than Puna, with higher levels of tolerance to *Sclerotinia*.
- Bred for use in mixed pastures, especially under grazing by sheep.
- Contains around 2% of pink-flowered plants, distinguishing it from Choice.

**Choice** *(Agricom)*
- Bred with lower levels of lactucin than Puna and Puna II, to reduce the risk of milk taint when cows graze pure stands for a number of days.
- More winter-active than Puna, and more uniform in leaf shape.
- Intended for use on dairy farms, especially in pure stands or with legumes.
- Probably less persistent in pastures than Puna or Puna II as lower lactucin may be associated with lower disease tolerance.
- Contains only blue-flowered plants.
PLANTAIN  
(Plantago lanceolata)

A perennial, forage herb that produces high-quality summer herbage. Plantain is well known as a flatweed in drier areas and as 'lambs tongue', an upright herb common in Australian dairy pastures. It has upright flowerheads with prominent creamy-white stamens.
**BROWNTOP (Bent Grass)**  
*Agrostis capillaris* syn. *A. tenuis*  

Browntop is a dull, fine-leaved perennial grass that likes moist acidic infertile situations and makes an excellent turf grass. It is very aggressive against weeds and responds well to nitrogen. Excellent for fine turf such as golfing greens.

Browntop usually has short, creeping rhizomes, fine rounded tillers and a ligule. Its finely branched panicle flowerheads bear small florets that produce very small seeds.

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**Grasslands Egmont** *(PGG Wrightson Seeds)*
- Dark green selection from plants collected on New Zealand and Australian golf greens.
- Suitable for home lawns, parks, golf greens and other amenity areas that do not get severe wear.

**Grasslands Sefton** *(PGG Wrightson Seeds)*
- Bright green selection from plants collected on New Zealand and Australian golf greens.
- Suitable for home lawns.
- Greater density and brighter colour make it especially attractive on well-maintained surfaces such as golf greens.
CRESTED DOGSTAIL
(Cynosurus cristatus)

A fine-leaved, fast-establishing grass, suitable as a companion for establishing other species, and especially suited to cool, temperate climates.

AVIAN TURF GRASS

AgResearch has discovered a wide range of secondary metabolites produced by endophyte fungi in association with their host grasses. It has been found that there is a wide variation in feeding responses of wild life to endophytes. Specialist grass/endophyte combinations have been developed that have properties which induce sickness in herbivorous birds that discourages further feeding and also reducing insect numbers know to be an attractant to foraging birds.

Grasslanz Selection (Grasslanz Technology)
- Turf grass with selected endophytes that reduces insect numbers and feeding activity on insectivorous birds.
- The selected endophytes have compounds that will induce sickness and avoidance behaviour of birds.
- Turf grass with selected endophytes that are more tolerant and have improved ability to survive in low fertility environments.
- Suitable for parks, sports fields, and airports where feeding birds are a problem.
CYNODON  
(Cynodon dactylon and Cynodon transvaalensis)

Also known as Indian Doab, Bermuda grass and couch, these species are perennial subtropical grasses that grow well in temperate climates. Cynodon is fine leaved and highly stoloniferous, forming a dense, hard-wearing turf, suitable for sports grounds. It is summer active (September to May) with superior drought resistance, maintaining a green cover summer throughout. Winter dormant, the herbage is 'browned off' by frosts, but combined with browntop for cool season growth, a green year-round lawn can be maintained. Cynodon lawns must be formed from vegetative plant units, rather than sown seed. Establishment is rapid.
COTULA (Cotula dioica and Cotula maniototo)

These species are the only widely used forage or turf plants that are New Zealand native plants. Bowling greenkeepers started using Cotula dioica in Dunedin around 1913 and C. maniototo, found growing in the Maniototo area of Otago, was planted into greens some years later.

Between 80 and 90 percent of New Zealand’s modern bowling greens are now cotula-based, mainly C. dioica in the north, and C. maniototo in the south.

Cotula provides a very uniform playing surface with good speed. It is more persistent than grass, stands close mowing down to 1-2 mm, and green speed is less affected by wet weather than a grass surface. However, cotula greens must be formed from vegetative plant units, rather than from sown seed.

Grasslands Pahia (AgResearch)
- More dense than the standard Cashmere type.
- Has greater spreading ability.
- Leaves finer and less erect.
- Thought to have greater tolerance to pests and diseases.
- Foliage colour is more natural bronze than the usual green.