



**Nutritious
pasture that
enables
livestock
to thrive**



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Aber High Sugar Grass that's bred to perform

Pictured: AberGreen AR1

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Reference Guide

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Benefits of Aber High Sugar Grass

All farmers want their stock to thrive. Fundamental to that is palatable and nutritious pasture that can recover strongly between grazings, persist well, tolerate heavy traffic when wet underfoot and lift animal production.

Aber High Sugar Grasses (HSG) have been developed to consistently offer:

- ✓ Improved digestibility
- ✓ Better nutrition
- ✓ Greater animal productivity
- ✓ Enduring persistence
- ✓ Environmental benefits

Benefits of Aber High Sugar Grass over standard ryegrass:

- ✓ 5% gain in digestibility³
- ✓ An extra 1.4L of milk per day⁴
- ✓ 100g extra of liveweight per lamb per day⁴
- ✓ 200g extra liveweight per cow per day⁴



**IMPROVED
DIGESTIBILITY**

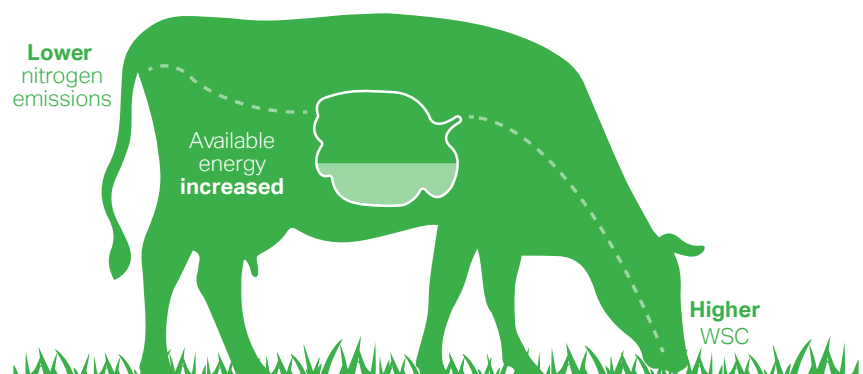
Aber HSG varieties are more digestible because they contain lower levels of fibre and more water-soluble carbohydrates (WSC)¹.

Digestibility is a measure of how much of the feed eaten can be used by the animal for metabolic functions, including maintenance, growth, milk production and reproduction. Digestibility is measured in the laboratory using synthetic enzymes, which simulate the digestion process that occurs within an animal. The results are used to estimate the Digestible Organic Matter in the Drymatter % (DOMD) which is commonly referred to as digestibility. Higher digestibility values are beneficial because they drive higher feed energy values and higher intakes.

Metabolisable Energy (ME) is the amount of energy an animal can derive from a feed. It is measured in megajoules of energy per kilogram of forage drymatter (MJ/kgDM). There is a direct relationship between digestibility and metabolisable energy. One percentage increase in digestibility (DOMD) equates to an additional 0.15 MJ/kgDM of ME².

The perennial diploid AberGreen has been shown to have a digestibility of 5.5%, higher than another commercially available perennial ryegrass³. This difference is calculated to produce an extra 1.4 – 1.5 litres of milk per day from a dairy cow⁴.

**Aber HSG helps capture more
plant protein in the rumen**





GREATER ANIMAL PRODUCTIVITY

Farmers have seen Aber HSG pasture grazed 'like a mower', the lambs stay clean and the bulls are more content.

An AgResearch trial showed cows fed Aber HSG produced 10% more autumn milksolids than cows fed a standard ryegrass⁶. Lambs grazing Aber HSG in a New Zealand trial finished 17% faster and 19% heavier than lambs grazing a standard NZ perennial ryegrass⁷.

Why the increase in production?

- Aber HSG's improved digestibility increases the supply of readily available energy to assist in building more microbial protein in the rumen
- Aber HSG's enhanced palatability encourages increased intake of dry matter

Scientists calculate a digestibility gain of 1% enables a dairy cow to produce an extra 0.28 litres per day, a beef animal to produce an extra 40 grams of meat per day and a lamb to gain an extra 20 grams of meat per day⁴. AberGreen, being 5.5% higher in digestibility when compared with a standard ryegrass³, offer the potential for dairy cows, beef cattle and lambs to significantly increase milk or meat production.

Better nutrition



BETTER NUTRITION

Aber HSG varieties are bred to produce more water-soluble carbohydrates (WSC) or sugar energy – delivering up to 17% more WSC than a standard diploid perennial ryegrass⁵.

Enduring persistence



ENDURING PERSISTENCE

Pasture persistence is absolutely essential but is the easiest trait to lose when plant breeders strive to improve a plant's forage value.

Aber HSG plant breeders are well aware of this and make strong and dense root and tiller growth a priority.

A trial near Ashburton conducted by Plant Research (NZ) Ltd showed AberGreen outperformed a popular standard variety for yield in that trial's third and final year, when yields commonly start to diminish³.

Aber HSG pastures are reported to persist and perform on farms throughout New Zealand for over ten years, providing good ground cover and quicker recovery after grazing and dry spells.

Environmental benefits



ENVIRONMENTAL BENEFITS

Cattle, sheep and deer are poor converters of herbage protein, using only 20% for production with the rest wasted in faeces and urine.

The high level of WSC in Aber HSG varieties provides a more readily fermentable energy. Research at IBERS shows this increases the capture of rumen degradable protein into microbial protein and reduces the amount of N lost in urine⁸.

New Zealand research shows rumen ammonia to be significantly lower in cows grazing Aber HSG⁹. The improved use of ruminal protein suggested by this data could provide environmental advantages in reducing nitrogen excretion⁹.

The release of methane gas from sheep and cattle amounts to almost one third of New Zealand's greenhouse gas emissions, and it is the largest contributor. Methane also accounts for over 40% of all emissions in terms of global warming potential. The extra water-soluble sugars in Aber HSG can change rumen fermentation patterns, reducing methane emissions. An AgResearch trial showed 9% lower methane emissions from sheep fed AberMagic compared with a conventional diploid variety⁵.



AberGreen is a deep rooting ryegrass with very fine and dense tillers, making it a robust plant under all farm types.

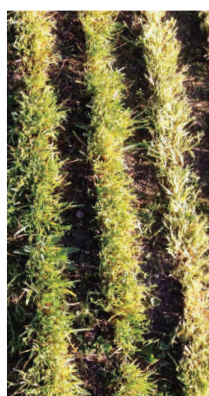
AberGreen is the first perennial ryegrass to offer the closest to optimum energy:protein ratio.

Quality of grass is just as important as total yield. A digestibility gain of 1% can improve animal performance by up to 5%. Animals have a higher voluntary intake with high digestibility and can absorb more energy from the feed, meaning animals fed good quality grass will yield more. An increase of 1% in digestibility has been measured to increase grass dry matter intake by 0.2 kg per cow per day. AberGreen is 5.5% higher in digestibility when compared to a standard ryegrass.

- Vigorous ground cover
- Optimum energy-to-protein balance
- Excellent digestibility under grazing and silage management
- Bred for enduring persistence
- Superior late spring yields



AberGreen

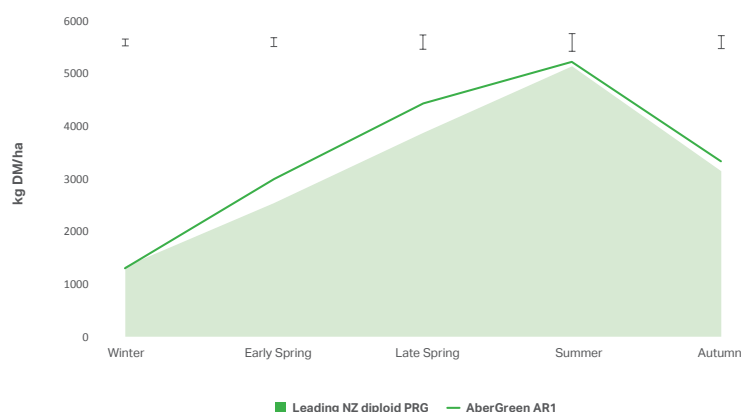


Standard NZ Ryegrass

The increased tiller density of AberGreen (left) compared with a standard NZ ryegrass (right), provides superior ground cover, meaning less room for weeds, greater tolerance to pugging and more light captured for grass growth.

Type	Perennial Ryegrass
Ploidy	Diploid
Sowing Rate	20 - 25Kg/ha
Heading Date	Late +17 days
Endophyte	AR1

Seasonal growth curve (kg DM/ha) of AberGreen AR1 perennial ryegrass compared with a leading NZ diploid ryegrass*



*Data taken from combined perennial ryegrass trials (partially irrigated) in Canterbury, New Zealand. Error bars show the LSD value when significant differences occurred ($P < 0.05$).

Nutritive value data

Table 1.

Water-soluble carbohydrate concentration (% DM) of perennial ryegrass cultivars in year one of a Waikato NFVT trial (N215WAI).

Note: this trial included a total of 31 cultivars on which the statistical analysis was conducted, however six non-commercial lines have been removed from this presentation as requested by the NZPBRA.

Entry	Winter		Early Spring		Late Spring		Summer		Autumn		Year	
AberGreen AR1	28.8	ch	31.4	ab	20.7	ab	20.4	a	18.1	a	23.1	a
AberMagic AR1	31.8	a	30.8	ae	21.7	a	18.4	b	16.4	b	22.7	ab
Bealey NEA2	31.6	ab	32.0	a	18.9	bi	16.3	df	16.1	bc	21.9	bc
Jeta AR1	29.3	cf	31.2	ac	20.6	ac	16.6	ce	15.8	bd	21.6	cd
Platform AR37	29.7	ac	29.6	bh	19.9	ad	17.0	cd	14.6	eh	21.1	ce
Viscount NEA4	29.3	cf	30.6	af	19.0	bh	15.2	fk	15.3	be	20.8	df
Base AR37	29.4	ce	30.6	af	19.6	bf	15.3	ek	14.6	ei	20.7	df
Hustle AR1	27.9	ck	30.0	ah	19.2	bg	16.0	dh	15.2	cf	20.7	eg
Trojan NEA2	29.0	cg	29.0	ci	18.7	cj	16.2	dg	14.8	dg	20.5	eh
Stellar AR1	25.9	kn	27.9	hj	18.8	bi	17.8	bc	15.5	be	20.4	eh
Halo AR37	28.4	ci	30.1	ah	18.4	dn	15.5	ej	14.7	eh	20.4	ei
Alto AR37	27.8	ck	30.2	ag	19.8	be	15.5	ej	13.9	gl	20.3	ei
Ansa AR1	29.7	cd	29.2	dh	18.6	dk	15.2	fl	14.2	gj	20.3	fj
24Seven Happe	29.5	be	30.2	ag	16.9	jn	14.5	im	13.5	in	19.8	gl
Prospect AR37	27.6	el	28.5	fj	19.3	bg	15.4	ej	13.5	io	19.8	gl
Expo AR37	26.5	in	28.5	fj	18.5	dl	15.7	di	14.1	fk	19.7	gm
Bronsyn SE	27.0	gm	29.9	ah	18.5	dl	15.0	gm	13.2	jo	19.6	hm
Matrix SE	26.9	hm	29.6	bh	18.7	cj	15.1	fm	12.7	mo	19.5	im
Request AR37	26.1	kn	28.6	ej	18.4	dm	15.2	fm	13.3	jo	19.3	kn
One50 AR37	27.3	fm	29.0	di	16.8	ln	14.9	gm	13.4	jo	19.2	kn
Rely AR37	27.0	gm	28.5	fj	16.6	mn	14.8	hm	13.6	hm	19.1	kn
Excess AR37	26.0	kn	28.3	gj	17.8	fn	14.9	gm	13.1	ko	19.0	ln
Moxie AR1	25.4	mo	27.2	ik	17.2	hn	14.9	gm	13.6	hm	18.8	mo
Bronte Happe	25.6	lo	27.2	ik	17.6	gn	14.0	km	12.5	no	18.3	no
Ultra AR1	23.5	o	25.5	k	16.9	jn	14.7	hm	12.9	lo	17.9	o

F Test	***	***	***	***	***	***
CV%	5.4	5.4	7.3	6	5.7	3.4
LSD 5% level	2.1	2.2	1.9	1.3	1.1	0.9
Trial Mean (kgDM/ha)	27.7	29.2	18.4	15.6	14.2	20

Table 2.

Metabolisable energy concentration (MJME/kg DM) of perennial ryegrass cultivars in year one of a Waikato NFVT trial (N215WAI).

Note: this trial included a total of 31 cultivars on which the statistical analysis was conducted, however six non-commercial lines have been removed from this presentation as requested by the NZPBRA.

Entry	Winter		Early Spring		Late Spring		Summer		Autumn		Year	
Bealey NEA2	13.3	a	13.4	a	12.3	bc	12.0	bc	12.5	ac	12.6	a
AberGreen AR1	12.6	bi	13.2	bd	12.3	bc	12.4	a	12.6	ab	12.6	ab
AberMagic AR1	12.4	di	13.1	bf	12.5	a	12.3	a	12.6	a	12.6	ac
Jeta AR1	13.2	ab	13.2	ab	12.3	bc	11.9	ej	12.4	cd	12.5	ad
Halo AR37	12.8	ag	13.2	bd	12.3	bd	11.9	cf	12.4	bd	12.5	bd
Platform AR37	13.0	ad	13.1	bf	12.2	bf	12.0	ce	12.3	fk	12.4	ce
Base AR37	12.9	af	13.2	ab	12.2	bf	11.9	cg	12.3	ei	12.4	ce
Viscount NEA4	12.6	bi	13.1	bf	12.3	b	12.0	ce	12.4	df	12.4	df
Matrix SE	12.7	ag	13.1	be	12.3	bc	11.9	cf	12.2	hl	12.4	dg
Stellar AR1	12.5	bi	12.9	ek	12.1	el	12.1	b	12.4	ce	12.4	dg
Ansa AR1	12.7	bh	13.0	ci	12.2	di	11.8	fj	12.3	fi	12.3	eh
Alto AR37	12.7	ag	13.1	bg	12.1	el	11.8	fk	12.2	in	12.3	ei
Trojan NEA2	12.8	ag	13.0	ek	12.1	el	11.7	hn	12.2	fk	12.3	ej
24Seven Happe	12.5	ci	13.1	bh	12.1	dj	11.8	hm	12.2	in	12.3	hl
Prospect AR37	12.5	bi	13.0	ek	12.2	ch	11.7	lo	12.2	gk	12.3	hm
Expo AR37	12.2	gj	12.9	hl	12.2	bf	11.9	cg	12.2	hm	12.2	hm
Request AR37	12.6	bi	12.9	hl	12.1	el	11.8	gl	12.1	mo	12.2	im
Ultra AR1	12.4	di	12.7	l	12.2	cg	11.8	hm	12.2	ko	12.2	in
One50 AR37	12.7	ag	13.0	dj	11.8	m	11.6	no	12.1	lo	12.2	in
Hustle AR1	12.3	ei	12.8	jl	12.1	fl	11.8	hn	12.2	im	12.2	in
Excess AR37	12.3	di	12.9	hl	12.2	cg	11.7	io	12.1	mo	12.2	jn
Bronte Happe	12.2	gj	12.8	kl	12.1	dk	11.8	fk	12.2	jn	12.2	jn
Rely AR37	12.6	bi	12.9	gl	11.9	m	11.7	ho	12.1	no	12.2	jn
Moxie AR1	12.7	bi	12.8	kl	11.9	m	11.6	o	12.0	op	12.1	mn
Bronsyn SE	12.2	fj	12.8	jl	12.0	km	11.6	mo	11.9	p	12.1	n

F Test	***	***	***	***	***	***
CV%	3.7	1.1	1	0.9	0.7	0.8
LSD 5% level	0.6	0.2	0.2	0.1	0.1	0.1
Trial Mean (kgDM/ha)	12.6	13	12.1	11.9	12.3	12.3



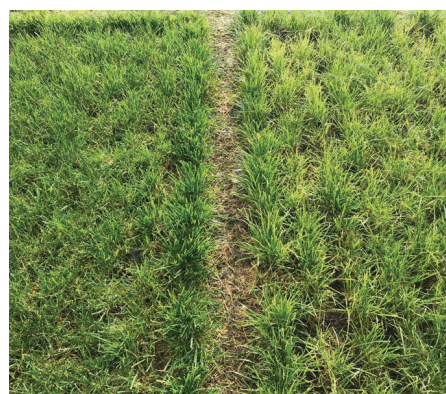


AberGain is a tetraploid high sugar ryegrass, meaning it has been bred to contain a higher level of water-soluble carbohydrates, or sugars, than traditional perennial ryegrass.

Tetraploid perennial ryegrasses provide higher utilisation and increased production per hectare compared with diploid perennial ryegrasses, due to increased palatability and greater animal preference. AberGain provides all these benefits, and combined with its densely tillered nature, offers farmers real potential to lift animal production.

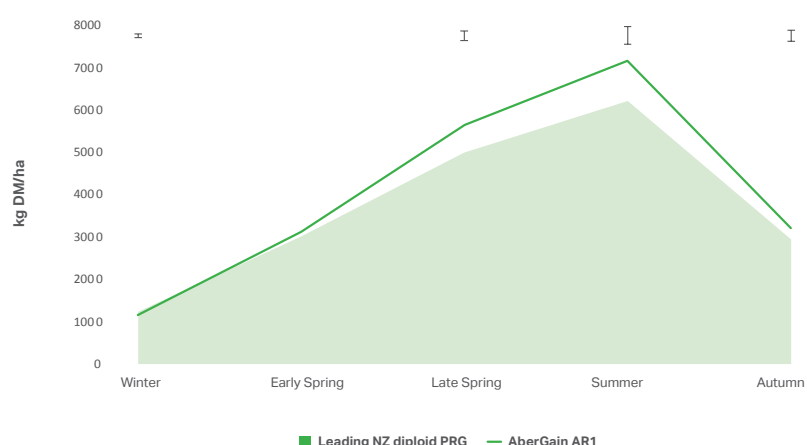
- The only tetraploid High Sugar Grass available in Australia currently
- Densely tillered for improved grazing tolerance compared with conventional tetraploid ryegrasses

Type	Perennial Ryegrass
Ploidy	Tetraploid
Sowing Rate	25 - 30Kg/ha
Heading Date	Very Late +24 days
Endophyte	AR1



Superior tiller density of AberGain (left) is demonstrated compared with a standard NZ tetraploid perennial ryegrass (right), providing improved recovery following grazing and greater tolerance to severe grazing events.

Seasonal growth curve (kg DM/ha) of AberGain AR1 perennial ryegrass compared with a leading NZ tetraploid ryegrass*



*Data taken from combined perennial ryegrass trials (partially irrigated) in Canterbury, New Zealand. Error bars show the LSD value when significant differences occurred ($P < 0.05$).



Pictured: AberGain AR1



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