PGG Wrightson Seeds

Brassica Guide

2019/20

PGG WRIGHTSON SEEDS IS PROUD TO DELIVER THE ULTIMATE BRASSICA RANGE FOR YOUR BUSINESS.

= Kale performance bred®

= Swede performance bred®

= Rape performance bred®

= Turnip performance bred®

= Leafy Turnip performance bred®

= pallaton RAPHNO®

Stock suitability key:
The following stock icons shown on the product pages indicate stock type suitability.

- Dairy
- Beef
- Sheep
- Deer

Contents

About PGG Wrightson Seeds

PGG Wrightson Seeds is Australasia's largest seed company and has been helping farmers for over 150 years.

Research and development are key to our success, we invest well in excess of $10 million per annum into our forage and endophyte programmes.

We have relationships with two primary research partners:

- AgResearch
- Plant and Food Research

At PGG Wrightson Seeds we appreciate that there is a lot of information around brassica and forage crops. Our aim is to help remove some of the confusion and make your decision easier. Your local PGG Wrightson Seeds Sales Agronomists are always there to help with your decisions.

Call your local Area Sales Agronomists shown on pages 58-59 of this Brassica Guide or visit us at www.pggwrightsonseeds.com

Why PGG Wrightson Seeds?

- We have access to world leading research and development
- Animal grazing trials are incorporated into the plant breeding
- Staff are practical, focusing on increasing your meat, milk or wool production
- Helping New Zealand farmers achieve their goals for over 150 years
- We deliver market leading technologies (for example the Cleancrop™ Brassica System, Pallaton Raphno® and AR37 endophyte)

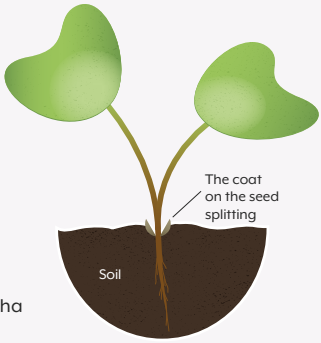
What's new

ULTRASTRIKE® PELLETED SWEDE & TURNIP SEED

Ultrastrike® pelleted swede and turnip seed is a weight build-up seed coating allowing precision placement of swede and turnip seed in modern precision drills. Precision placement of seed produces an evenly distributed crop that allows bulb yields to be maximised.

Split Coat Germination

With the Splitkote system, oxygen and moisture from the soil penetrate the pellet, initiating germination. As the seed expands this forces the pellet to split before the seed begins to sprout. The Splitkote pellet does not require any more soil moisture than what would be required to germinate un-pelleted brassica seed. The seed pellet is made up of lightweight coating materials, yet it is hard enough to avoid damage during transportation and sowing. The pellet does not persist in the soil as it will break-down completely over time.



An optimum sowing rate for pelleted swede of 90,000 seeds/ha and 140,000 seeds/ha for pelleted turnip is recommended.

Molybdenum

Ultrastrike® seed treatment also contains the trace element molybdenum to assist seedling growth.

Social media

FOLLOW PGG WRIGHTSON SEEDS ONLINE!

Facebook and Instagram

Follow PGG Wrightson Seeds on Facebook for regular updates, the latest advice and occasionally, chances to win. Also join us on our Instagram page to stay up to date with great images and what's happening in the field.

Do share your photos and stories with us via social media, as we love hearing them and having the opportunity to link with the wider PGG Wrightson Seeds community.

facebook.com/pggwrightsonseeds

pggwrightsonseeds

Social media

JOIN CHARLOTTE WESTWOOD ON FACEBOOK AND TWITTER!

Introducing Veterinarian Nutritionist Charlotte Westwood:

Charlotte is a qualified veterinarian (BVSc, MANZCVS, PhD) with over 25 years of experience in vet science, animal nutrition and farm systems. In her current role as Veterinary Nutritionist for PGG Wrightson Seeds she consults widely to a number of large corporate farming businesses and is involved in research and development and extension work with PGG Wrightson Seeds retail customers. Prior to this Charlotte has worked as a cattle veterinarian and as a farm consultant in both New Zealand and Australia.

Charlotte is particularly interested in interactions between nutrition, animal health and reproductive performance of cattle and sheep within pasture, crop or total mixed ration based farm systems. She has published a number of papers on these topics and is a regular presenter at farming related conferences.

Twitter and Facebook

Follow Charlotte's Twitter account @CharlottePGWS where she shares regular updates providing useful advice and information. Also join Charlotte's interactive Facebook group "The Rumen Room" where members engage with Charlotte and each other to share information and gain advice.

JOIN CHARLOTTE'S ONLINE COMMUNITY

What winter brassica is suitable for my farm?

1

ARE WEEDS A PROBLEM IN YOUR BRASSICA PADDOCKS?

NO

Conventional brassicas are suitable for me.

YES

cleancrop Brassica System is an option for me.

- CLEANCROP™ HAWKESTONE SWEDE
- CLEANCROP™ FIREFLY KALE
- CLEANCROP™ RAPE
- CLEANCROP™ BULB TURNIP

2

IS SUMMER MOISTURE A CHALLENGE FOR YOU?

NO

- SWEDE
- KALE
- RAPE
- BULB TURNIP

YES

- KALE
- RAPE
- BULB TURNIP

3

DAYS TO GRAZING?

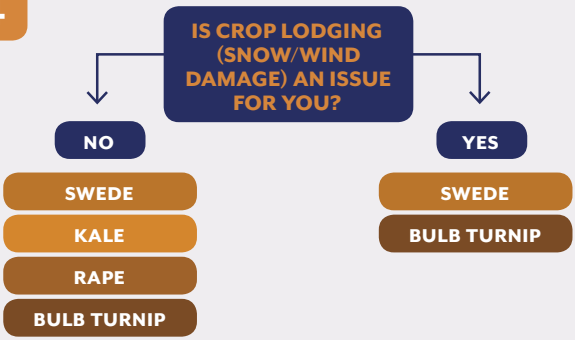
90 -120 DAYS

- RAPE
- BULB TURNIP

150 -250 DAYS

- SWEDE
- KALE

4



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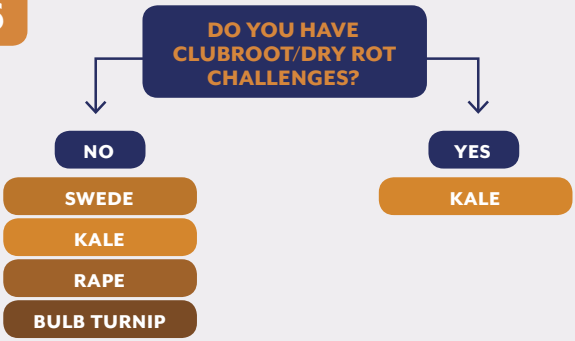
6



What summer brassica is suitable for my farm?

1

ARE WEEDS A PROBLEM IN YOUR BRASSICA PADDOCKS?

NO

Conventional brassicas are suitable for me.

YES

cleancrop® Brassica System is an option for me.

- **CLEANCROP™ RAPE**
- **CLEANCROP™ BULB TURNIP**
- **CLEANCROP™ LEAFY TURNIP**

2

IS SUMMER MOISTURE A CHALLENGE FOR YOU?

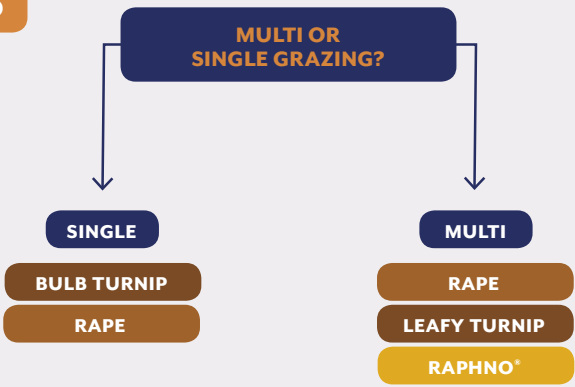
NO

- **BULB TURNIP**
- **LEAFY TURNIP**
- **RAPE**

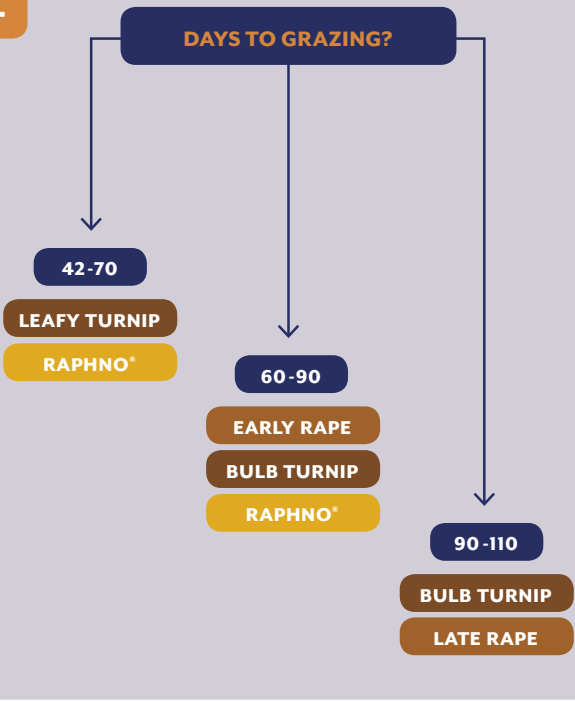
YES

- **RAPE**
- **RAPHNO®**

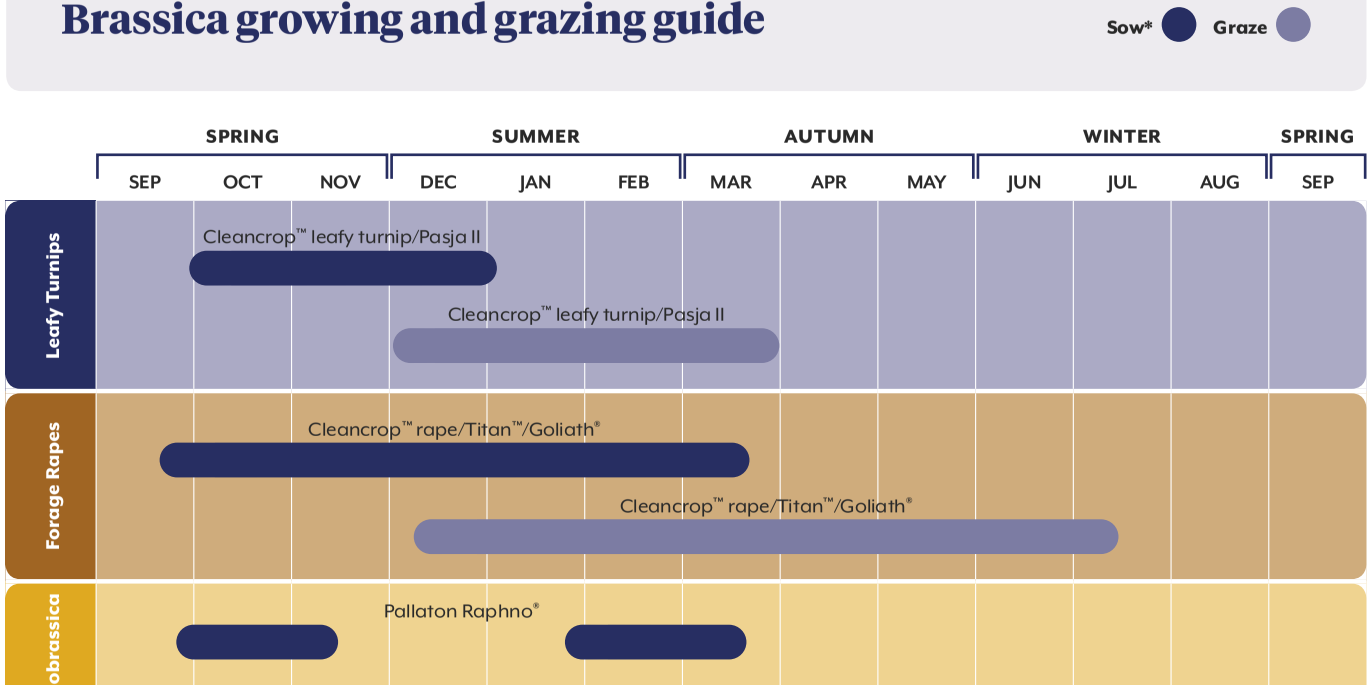
3

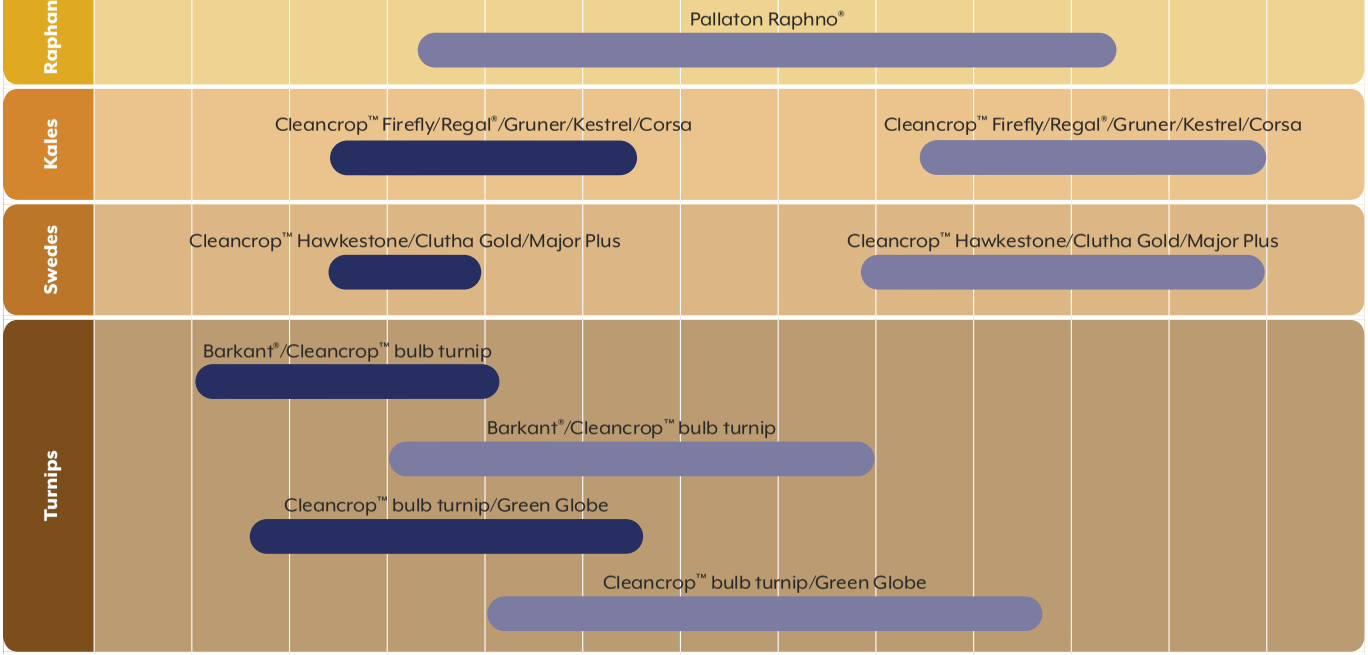

MULTI OR
SINGLE GRAZING?
SINGLE
BULB TURNIP
RAPE
MULTI
RAPE
LEAFY TURNIP
RAPHNO®

4


DAYS TO GRAZING?
42-70
LEAFY TURNIP
RAPHNO®
60-90
EARLY RAPE
BULB TURNIP
RAPHNO®
90-110
BULB TURNIP
LATE RAPE

Brassica growing and grazing guide





Check with your seed retailer for the best time to sow and graze crops in your area.

** Make sure soil temperatures are around 10°C and rising before sowing.*

Cleancrop™

cleancrop® Brassica System

Cleancrop™ Brassica Seed

Cultivars that have been BRED to be tolerant to the sulfonylurea herbicide Telar®

FMC Telar® Herbicide

A broad spectrum herbicide that provides EXCELLENT control of broadleaf weeds from the pre-emerge stage

WHAT IS IT?

The **Cleancrop™ Brassica System** is a simple weed management system which eradicates a range of key problem weeds commonly found in brassica crops.

The **Cleancrop™ Brassica System** (seed + herbicide) package enables you to control your weeds at the time of sowing.

Telar® herbicide controls these weeds:

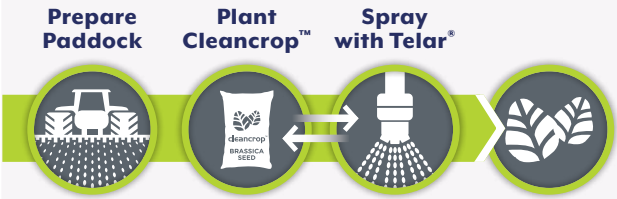
Calandrinia	Nodding Thistle	Stinking Mayweed
Californian Thistle*	Rayless Chamomile	Twin Cress
Chickweed	Redroot	Vetch
Cornbind	Scarlet Pimpernel	White Clover
Dandelions	Scentless Chamomile	Wild Turnip*
Docks	Scotch Thistle	Willow Weed
Fathen	Shepherd's Purse	Yellow Gromwell
Hawksbeard	Spurrey (Yarr)	

Apply Telar® at the pre-emerge stage within 48 hours of sowing.

* Apply Telar® post-emerge when Cleancrop™ brassicas are at the fourth-leaf stage. Consult your retailer to order your second Telar® spray.

Cleancrop™

HOW DOES IT WORK?



The **Cleancrop™ Brassica System** (seed + herbicide) package enables you to control your weeds at the time of sowing.

CLEANCROP™ BENEFITS

- **Control Weeds within 48 hours of sowing***
- **No moisture required to activate Telar® herbicide#**
- **No soil incorporation required**
- **Adaptable to method of sowing**

*Telar® can be applied at the post emergence stage when brassicas are at least at the fourth-true leaf stage. #A heavy dew is typically required to activate Telar®. Moisture will increase the efficacy.

CLEANCROP™ PACKAGES

All **Cleancrop™ Brassica System** cultivars are ordered on a per hectare basis and include 20g/ha Telar®.

Leafy Turnip	4 kg/ha
Rape	4 kg/ha
Bulb Turnip (Summer)	2 kg/ha
Bulb Turnip (Winter)	1 kg/ha
Bulb Turnip (Pelleted) NEW	140,000 seeds/ha
Hawkestone Swede	1 kg/ha
Hawkestone Swede (Pelleted)	90,000 seeds/ha
Hawkestone Swede (Ridging Pack)	0.7 kg/ha
Firefly Kale	4 kg/ha

Note: The Cleancrop™ Brassica System is unique. PGG Wrightson Seeds sell it as a package, i.e. Seed + Chemical. One item cannot be purchased without the other. Merchants have to be accredited to sell the Cleancrop™ Brassica System to ensure stewardship is maintained.

Why use Cleancrop™?

A SIMPLE WEED MANAGEMENT SYSTEM

No other forage brassica system combines the power of traditionally bred herbicide tolerant plants + broad spectrum herbicide that will MAXIMISE on farm crop performance.

Simple Planning

Give your crop a head start
Weeds are controlled right from the start

All in one pack
Receive the exact amount of seed and chemical for the job

Maximise Performance

Reduce competition
for moisture + nutrients

ELIMINATE
historically difficult to control weeds*

*Over 23 susceptible weeds

Increase performance
Excellent agronomic cultivars

On-going Benefits

Maximise Yield = Low c/kgDM

Short plant back
Only 3 month grass and clover plant back period*

Cleaner new pasture paddocks

*Refer to the latest Cleancrop™ Brassica System Guide for more information.

Firefly KALE

Cleancrop™ Brassica System

LIMITED STOCK 2019

NEW ZEALAND BRED

Farm type	Days to grazing	Sowing rate
	150-220 days	4 kg/ha

- High yielding, intermediate height kale
- High leaf to stem ratio with very good late winter leaf percentage
- Excellent crop utilisation due to selection for soft stems
- Very good winter hardiness and excellent pest and disease tolerance

Cultivar	Leaf %	Total Yield	Maturity (DAS)
Firefly kale	**33**	**100**	**150-220**
Regal®	32	101	150-220
Caledonian	21	106	150-220

4 trials: Gore, Hinds, Kimihia and Palmerston North (2015). In these trials conventional herbicides were used on all cultivars. Telar® was not applied. Where Telar® was used for Firefly and no herbicide applied to the other cultivars we would expect higher yields for Firefly kale.

Cleancrop™ Firefly kale (left) compared with conventional kale (right) under wild turnip pressure.

Hawkestone SWEDE

Cleancrop™ Brassica System

Farm type

Days to grazing

170-250 days

Sowing rate

RIDGING	CONVENTIONAL SOWING	PELLETED
0.7 kg/ha	1 kg/ha	90,000 seeds/ha

- High yielding yellow-fleshed swede with medium maturity
- Similar dry rot and clubroot tolerance to Aparima Gold
- Good leaf disease tolerance
- Plant glucosinolate* levels similar to Aparima Gold swede
- Pelleted seed available, see page 33 for more information

*Three main glucosinolates; progoitrin, glucobrassicin and neoglucobrassicin

Cultivar	Bulb Yield	Leaf Yield	Leaf %	Total Yield	Maturity (DAS)
Hawkestone	**100**	**100**	**24**	**100**	All cultivars have the same maturity: 170-250
Aparima	89	118	28	96	
Clutha Gold	104	115	26	106	
Invitation	70	121	35	82	

4 trials: Gore, Hinds, Kimihia and Palmerston North (2015). In these trials conventional herbicides were used on all cultivars. Telar® was not applied. Where Telar® was used for Hawkestone and no herbicide applied to the other cultivars we would expect higher yields for Hawkestone swede.

Cleancrop™ Hawkestone swede case study

CHRIS STEWART & DAVE STUART

Chris Stewart owns Glenrannoch Farms Ltd in Dipton, an 800 ha farm with 680 ha of this effective land. Dave Stuart manages the stock on the farm. This year they decided to plant Cleancrop™ Hawkestone swede alongside Kestrel kale. In total on the farm there is 40 hectares of crop, with 34 of this being swedes. As per best practice the Hawkestone was pre-emerge sprayed with Telar® and the Kestrel had Trifluralin applied. The significant comparison between the two crops was evident as shown in the photos from Glenrannoch Farm below. Cleancrop™ Hawkestone controlled a wide variety of weeds such as fathen, wild turnip, willow weed (red shank), Shepherd's Purse and spurrey (yarr). Dave says "We found Cleancrop™ Hawkestone much easier to use than traditional brassica crops, and have found that the subsequent second crop brassica and new pasture following Cleancrop™ is significantly cleaner of weeds."

Kestrel kale left and Cleancrop™ Hawkestone swede on Glenrannoch Farms Ltd showing the control Telar® has over a wide variety of weeds.

Dave Stuart, Stock Manager (left) and Chris Stewart, Owner (right) on Glenrannoch Farms Ltd.

Bulb Turnip

Cleancrop™ Brassica System

Farm type

Days to grazing

80-110 days

Sowing rate

CONVENTIONAL SOWING
1-2 kg/ha*

PELLETED
140,000 seeds/ha

- High yielding bulb turnip
- Suitable for sowing from late spring through to late summer
- Suitable for summer/autumn/winter feed

* Sowing rate: 2 kg/ha (summer)
1 kg/ha (winter)

Cultivar	Bulb Yield	Leaf Yield	Leaf %	Total Yield	Maturity (DAS)
Cleancrop™ bulb turnip	**100**	**100**	**54**	**100**	**80-110**
Green Globe	87	93	55	90	90-120

4 trials: Kimihia (2013, 2016), Lincoln PFR (2013), Ruakura (2016). In these trials conventional herbicides were used on both Cleancrop™ bulb turnip and Green Globe. Telar® was not applied. Where Telar® was used for Cleancrop™ bulb turnip and no herbicide applied to Green Globe we would expect higher yields for Cleancrop™ bulb turnip.

Cleancrop™ bulb turnip case study

TROY HUGHES

Troy Hughes is sharemilking on a 150 ha milking platform in Pahiatua. The farm operates a pasture-based system with turnips used as summer feed and to clean up paddocks for their re-grassing programme. Troy used Cleancrop™ bulb turnip for the first time in the 2018/19 season and says, "I will use the Cleancrop™ system again as it is simple, robust and performs well." He found that the bulbs had good utilisation and didn't lose quality in the dry, especially given the dry summer and early autumn experienced by Pahiatua this year. Along with planting the Cleancrop™ bulb turnips this year, Troy also planted conventional turnips in order to make a comparison between the two. The Cleancrop™ paddock was pre-emerge sprayed with Telar® as per guidelines and no post-emergence herbicide or insecticide was required in comparison to the conventional turnips requiring an insecticide spray. Comparing yield, the Cleancrop™ bulb turnip yielded 12 tDM/ha and produced a more even crop versus 9 tDM/ha on the conventional crop which had massive variability within the crop. "When comparing Cleancrop™ versus conventional, Cleancrop™ clearly outperforms conventional due to yield, simplicity, less spraying and organisation required" says Troy. The other clear advantage Troy found Cleancrop™ bulb turnips had over conventional turnips was producing a much cleaner seed bed which will require minimal work to get back into permanent pasture. In Pahiatua Troy has found his weed challenges include redroot, buttercup and Shepherd's Purse, all which Telar® had fantastic control over.

PGG Wrightson Seeds Sales Agronomist, Paul Greenbank (left) and Troy Hughes (right) discussing the benefits of the Cleancrop™ Brassica System for Generation Farms re-grassing programme.

Rape

Cleancrop™ Brassica System

Farm type	Days to grazing	Sowing rate
	90-110 days	4 kg/ha

- A new generation rape x kale interspecies cross
- High yielding multi-graze rape with good leaf percentage and crop utilisation
- Multi-purpose forage rape with excellent summer/autumn/early winter feed
- Good regrowth potential with excellent winter keeping ability
- Similar aphid tolerance as Goliath®

Cultivar	Leaf %	Total Yield	Maturity (DAS)
Cleancrop™ rape	**76**	**100**	**90-110**
Titan™	75	89	70-90
Goliath®	69	101	90-110
Greenland	70	99	70-84
Interval	63	104	90-110

12 Trials: Culverden (2013), Lincoln PFR (2013, 2014), Hawkes Bay (2013), Kimihia Research Centre (2014, 2015, 2016 x2), Gore (2016), Oxford (2016), Taihape (2016) and Ruakura (2016). In these trials conventional herbicides were used on all cultivars. Telar® was not applied. Where Telar® was used for Cleancrop™ rape and no herbicide applied to the other cultivars we would expect higher yields for Cleancrop™ rape.

Leafy Turnip

Cleancrop™ Brassica System

Farm type	Days to grazing	Sowing rate
	42-70 days	4 kg/ha

- Multi-graze Pasja type with reduced bolting
- Fast-establishing, high quality feed
- Excellent plant persistence after multiple grazings*
- Provides a flexible grazing option for all stock classes over summer and autumn
- Minimal ripening requirement

*Moisture dependant.

Cultivar	Yield 1	Regrowth 1	Regrowth 2	Total Yield	Maturity (DAS)
Cleancrop™ leafy turnip	100	100	100	100	All cultivars have the same maturity: 42-70
Pasja II	64	85	82	75	

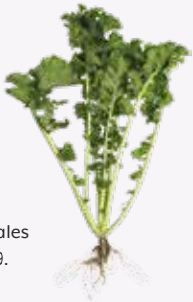
3 trials: Kimihia (2013, 2014, 2015). In these trials conventional herbicides were used on both Cleancrop™ leafy turnip and Pasja II. Telar® was not applied. Where Telar® was used for Cleancrop™ leafy turnip and no herbicide applied to Pasja II we would expect higher yields for Cleancrop™ leafy turnip.

pallaton
RAPHNO®

NEW ZEALAND BRED

THE SUCCESS OF SCIENCE

This hybrid has brought a number of impressive agronomic attributes into one cultivar, these include high forage yield from multiple grazing's, drought tolerance, clubroot tolerance and improved insect tolerance to a range of key insects.



For more information contact one of our Area Sales Agronomists. Contact details on page 58 and 59.

2002
POPULATION DEVELOPED

2009
FIELD BREEDING AND SELECTION

2010
FIELD & ANIMAL EVALUATION

KALE X RADISH

2015 SEED PRODUCTION

2016/17
LIMITED SEED AVAILABLE

2018
FULL COMMERCIAL RELEASE

South Island Pallaton Raphno® case study

DAVID AND LOUISE WIGHTMAN

David and Louise Wightman are farming in South Otago on a 230 hectare sheep farm. Previously they have been sowing leafy turnip for their summer feed requirements, with last year planting Pacer. This year their PGG Wrightson Techinical Field Representative, Kevin Thomson of Balclutha, provided them with Pallaton Raphno® seed to try after he won this at a training day. Kevin said "I provided the seed to David and Louise as I have a number of farmers that are growing Pallaton who have really benefited from the multiple grazings. Pallaton provides farmers with flexibility due to its multi-graze, multi-use qualities." Seven hectares of Pallaton was spring sown in late October 2018 and the first grazing occurred late December. They have rotationally grazed approximately 250 lambs across two paddocks. David and Louise followed best practice grazing management for Pallaton by not letting the crop get above knee-height between grazings. The first grazing they let the lambs graze the crop very hard, which didn't affect Pallaton's regrowth potential. In February 2019 they had completed three rounds of grazing and were starting to think about shutting the paddocks up to carry through for winter feed. David says "we are happy with how the Pallaton has performed and have learnt a lot about it and how to manage it in the future. Unlike leafy turnip, Pallaton can provide us with not just our summer feed but also winter feed as a 12-month option." Over winter David and Louise are planning on putting their hoggets on the Pallaton, as they expect the hoggets will do better on it, compared to traditional swedes that they also sow. Regarding management of the Pallaton crop, they pre-emerge sprayed with Ombre, with the only real issue they have had being thistles which they are addressing this autumn. There have been no insect issues with their crop and they added urea to the crop in late February for generating winter feed. David and Louise are planning to grow Pallaton again next season.

PGG Wrightson Technical Field Representative Kevin Thomson (left) and David Wightman (right) standing in Pallaton between grazings on Uplands Farm.

Kale

WHAT IS IT?

Late autumn/winter feed. A single graze option in May to August. Generally the taller the kale the higher the dry matter yield but leaf to stem ratio falls with taller kales.

When to sow?

- Spring/Summer

	Exceptional yield & good quality ↓ Regal® KALE performance bred®	Exceptional quality ↓ Kestrel® KALE performance bred®	Exceptional yield ↓ Gruner® KALE performance bred®	Exceptional yield & more leaf ↓ Corsa® # KALE performance bred®
Type	**Intermediate**	**Short**	**Giant**	**Giant**
Potential yield (tDM/ha)	16	14	17	17
Winter leaf retention	***	***	**	***
% Leaf	***	***	*	**
Stem quality	**	***	*	**

#A new generation giant kale with higher leaf to stem ratio and softer stems than traditional giant kales.

STAR CHART KEY

–	*	**	***
None	Moderate	Good	Very good

Note: a difference of one * means that there is statistically significant difference.

Choosing the best kale

Results from a Canterbury kale study (Westwood et al 2014)* can help identify the best kale for your property.

The study looked at DM yield, leaf percentage and quality of four types of kale through the 2013 winter. Kales were sampled monthly from May until September, with plant components (stem and leaf) sampled for nutritive value.

RESULTS

Dry matter yield: Regal® and Gruner yielded significantly more DM than Kestrel or Rawera kales. A late winter flush of leaf growth lifted yields of Regal® and Kestrel but not Gruner or Rawera.

Leaf percentage: Regal® and Kestrel delivered more leaf compared with Gruner or Rawera.

Energy content: Kestrel contained significantly more energy (MJME/kgDM) and less fibre (NDF) than the other kales. While Kestrel yielded less dry matter per hectare, the energy density of Kestrel lifted MJME yield per ha to levels comparable with other cultivars.

Stem quality: Kestrel had the best quality stem with MJME of top stem 13.0 and the stem base 11.6 MJME. Rawera stem base was very poor quality (8.7 MJME/kgDM), almost 3.3 MJME lower than stem top.

RECOMMENDATIONS

DM yield? If yield of feed is your only requirement, choose Regal® or Gruner. Both yield well, however Regal® flushed with new leaf growth in late winter while Gruner lost leaf. When late winter leaf and yield is needed, choose Regal® over Gruner.

Quality? Where stock live weight gain and/or body condition score is your priority, choose Kestrel. With very high quality stem and good leaf percentage, Kestrel delivers the premium feed option. Where yield and quality are equally important, Regal's® high leaf percentage and top yield delivers both, optimising performance for your stock.

*Westwood CT, Cutts M, Russell R, O'Brien K (2014). Effect of timing of harvest on nutritive value, and dry matter yield of four cultivars of kale (Brassica oleracea L. Var. acephala). Proceedings of the New Zealand Grasslands Association (in press)

Regal® KALE
performance bred®

Farm type	Days to grazing	Sowing rate
	150-220 days	4 kg/ha

THE KING OF KALES

Regal® kale - provides exceptional dry matter yields and good forage quality, the best of both worlds. When your stock need more winter dry matter and more leaf, Regal® delivers. New Zealand bred, high yielding Regal® gives you superior pest and disease tolerance, perfect for your local conditions. Late winter leafiness means good quality feed that lasts the distance, ideal for your pregnant and young stock.

Choose Regal® when your winter priority is for both yield and quality.

- Exceptional dry matter yields
- High leaf to stem ratio, with very good late winter leaf percentage
- Outstanding pest and disease tolerance
- New Zealand bred for New Zealand conditions
- Intermediate height

Kestrel KALE
performance bred®

Farm type	Days to grazing	Sowing rate
	150-220 days	4 kg/ha

TRUSTED NAME, TRUSTED QUALITY KALE

Kestrel kale - for when you need exceptionally high quality winter feed for top animal performance. Kestrels' high percentage of leaf and soft, digestible stems deliver an energy dense, easy to harvest feed. Soft stems offer excellent utilisation, even for younger sheep, deer and cattle. Late winter leafiness means better stock performance right through the season. Kestrel has the adaptability to fit into a range of farm systems and land types.

Kestrel, the perfect choice when animal performance is your priority.

- Outstanding leaf to stem ratio with very good late winter leafiness
- High whole plant MJME (metabolisable energy) content
- Soft, easy to harvest stems with very good stem quality from top to base
- Bred for low levels of SMCO (S-methyl cysteine sulphoxide)
- Short height

Corsa KALE

performance bred®

Farm type	Days to grazing	Sowing rate
	150-220 days	4 kg/ha

THE NEW GIANT KALE

Corsa is a new generation giant type kale that has been bred to revolutionise the giant kale market. With higher leaf percentage and higher stem quality than traditional giant kales. Corsa will deliver a high volume, high quality feed for your stock.

Corsa, the new generation giant kale for your stock.

- High yielding giant type kale
- Exceptional leaf percentage
- Winter hardy
- Softer stem compared to other giant type kales
- Good aphid tolerance

Gruner KALE
performance bred®

Farm type	Days to grazing	Sowing rate
	150-220 days	4 kg/ha

THE TRADITIONAL KALE

Gruner kale – the traditional kale choice for cattle wintering when dry matter yield is important. Good aphid tolerance sets Gruner kale up for reliable crop yields. Winter hardiness supports moderate yields of leaf.

Choose Gruner when dry matter yield is your priority.

- Exceptional dry matter yielding kale
- Winter hardy kale
- Good aphid tolerance
- Giant height

Swede

WHAT IS IT?

Winter feed option. Types used depend on time to feeding following sowing and level of disease tolerance to dry rot and clubroot.

When to sow?

- Spring/Summer

	High yield & medium maturity ↓ Clutha Gold SWEDE	Moderate yield & early maturity ↓ Major Plus SWEDE
Potential yield (tDM/ha)	18	16
Bulb softness	**	***
Flesh colour	Yellow	Yellow
Clubroot tolerance	**	–
Dry rot tolerance	**	–
Leaf keeping quality	**	*

STAR CHART KEY

–	*	**	***
None	Moderate	Good	Very good

Note: a difference of one * means that there is statistically significant difference.

Ultrastrike® pelleted swede seed

WHAT IS IT?

Ultrastrike® pelleted swede seed is a weight build-up seed coating allowing precision placement of swede seed in modern precision drills.

It also contains a systemic insecticide and two contact fungicides to provide critical insect and disease protection during establishment. Ultrastrike® also contains the trace element molybdenum which is taken up during seedling establishment, enhancing growth.

WHY SOW PELLETED SWEDE SEED?

Precision planting ensures an even placement of seed allowing bulb yield to be maximised. Three Southland trials (Wyndham, Tapanui and Ohai) demonstrated an average yield increase of 1,400 kgDM/ha (+10.5%).

SOWING RATE

The recommended sowing rate is 90,000 seeds per hectare. Seed is available in 1 hectare buckets.

Hawkestone, Clutha Gold and Major Plus are all available in pelleted form.

Hawkestone SWEDE Cleancrop™ Brassica System | Clutha Gold SWEDE performance bred® | Major Plus SWEDE performance bred®

Pelleted swede seed 33 DAS

Clutha Gold SWEDE

performance bred®

Farm type

Days to grazing

170-250 days

Sowing rate

CONVENTIONAL SOWING	PELLETED
0.8-1.5 kg/ha	90,000 seeds/ha

THE YIELD ADVANTAGE

Clutha Gold is the latest swede bred from the Forage Innovations plant breeding joint venture between Plant and Food Research and PGG Wrightson Seeds and was developed to supersede Aparima Gold swede. Clutha Gold has a significant yield advantage over Aparima Gold while maintaining its clubroot and dry rot disease tolerances.

The golden opportunity for your business. More yield. More profits.

- Very high yielding main crop swede
- New Zealand bred and evaluated
- Yellow-fleshed bulb with medium maturity
- Clubroot and dry rot tolerant
- Excellent winter keeping qualities
- Pelleted seed available, see page 33 for more information

Major Plus SWEDE

performance bred®

Farm type

Days to grazing

150-220 days

Sowing rate

CONVENTIONAL SOWING	PELLETED
0.8-1.5 kg/ha	90,000 seeds/ha

THE SOFTEST SWEDE

Major Plus – a traditional early maturing soft swede easily consumed by stock. When you need a dependable swede, Major Plus will be ideal for your stock.

Major Plus is the early maturing swede you can count on.

- Early maturity
- Good dry matter yields
- Softest bulb swede on the market
- Yellow-fleshed bulb
- Pelleted seed available, see page 33 for more information

Forage rape

WHAT IS IT?

Summer/autumn/winter feed suitable for all stock classes. Modern New Zealand bred cultivars are rape x kale parentage. Forage rapes have different maturities that can be multi-grazed or single grazed.

When to sow?

- Spring/summer/autumn

	Quality & early maturity ↓ Titan™ FORAGE RAPE performance bred®	Yield & quality ↓ Goliath® FORAGE RAPE performance bred®
Establishment	Spring/summer/autumn	Spring/summer/autumn
Days to grazing	70-90	90-110
Regrowth	**	***
Aphid tolerance	***	***
Energy content	***	**

STAR CHART KEY			
–	*	**	***
None	Moderate	Good	Very good

Note: a difference of one * means that there is statistically significant difference.

Why sow rape?

1. Versatile Forage

- Spring sown rape fills a summer feed gap
- Perfect non-pasture feed when facial eczema spore counts are high
- Finish lambs, feed ewe replacements or flush ewes in late summer
- For milking platforms, plant as part of a summer brassica feed system
- Start grazing Barkant® summer turnips, switch to rape later in summer
- Autumn sown rape will deliver high quality winter feed

2. High Quality

- Excellent leaf percentage (average 68%) with softer stems
- 11-13 MJME/kgDM with moderate to high crude protein *
- The ideal feed to balance summer pasture or silage/straw supplements over winter

3. Multi-graze Options

- Single or multi-graze
- Graze, close up for a month, then re-graze. Expect up to 3.5 tDM/ha at first re-grazing
- Combine rape with Italian or short rotation ryegrass to increase flexibility of rape as multi-graze option

4. Varying Maturity Dates

- PGG Wrightson Seeds rape cultivars range in maturity from 70-110 days after sowing
- Match feed supply with stock demand

5. Performs over a range of Fertility and Moisture Statuses

- Rape tolerates lower fertility soils – yields will improve when fertility is optimal
- Ideal for areas prone to summer or autumn dry
- More tolerant of drier conditions than leafy or bulb turnips – will perform best when irrigated or in summer safe areas

*(Westwood and Mulcock 2012)

Titan™ FORAGE RAPE

performance bred®

NEW ZEALAND BRED

Farm type	Days to grazing	Sowing rate
	70-90 days	4 kg/ha

THE TASTY FORAGE RAPE

Titan™ forage rape - the tasty rape your stock prefer to eat. Titan™ combines early maturity, high dry matter yields and exceptional tastiness to deliver a high quality summer/autumn/winter feed option. Strong regrowth potential offers multi-graze options for all grazing systems. Very good aphid and virus tolerance means Titan™ will last the distance under challenging conditions.

The best choice when dry matter yield and rapid acceptance by stock is important to you.

- Highest animal preference rape cultivar available
- Very good aphid and virus tolerance
- High dry matter yields
- Best whole plant MJME (metabolisable energy) content of our rapes
- Multi-graze option with excellent regrowth potential
- Early maturing

Goliath® FORAGE RAPE
performance bred®

NEW ZEALAND BRED

Farm type	Days to grazing	Sowing rate
	90-110 days	4 kg/ha

THE VERSATILE ALL ROUNDER

Goliath® forage rape - the multi-purpose forage rape that fits all farm systems. Goliath® performs strongly from spring/summer/autumn establishment, delivering feed when and where you need it. Graze Goliath® once or take advantage of superior regrowth potential for multiple grazings; the perfect flexible feed option for all stock classes. Very good aphid tolerance means Goliath® will go the distance.

Goliath® forage rape is the choice when crop versatility and dry matter yield is important to you.

- Very good aphid tolerance
- High dry matter yields
- Multi-purpose forage rape from spring/summer/autumn establishment
- Single or multi-graze
- Superior regrowth potential

Turnip

BULB TURNIP - WHAT IS IT?

Summer feed for milk production or young stock (e.g. Barkant®) or summer/autumn/winter feed for stock (e.g. Green Globe).

When to sow?

- Spring/summer

LEAFY TURNIP - WHAT IS IT?

Multi-graze option that can offer up to 4 summer grazings. Short sowing to grazing interval (42-70 days). Less requirement for ripening than rapes.

When to sow?

- Spring/summer

	Top yield & summer quality ↓ Barkant® TURNIP performance bred®	Moderate yield & summer/ autumn/winter feed ↓ Green Globe® TURNIP	Fast summer feed ↓ Pasja II® FORAGE BRASSICA performance bred®
Bulb Type	**Tankard**	**Globe**	**Swollen Root**
Potential yield (tDM/ha)	15	12	10
Maturity	Early	Late	Early
Establishment	Spring/summer	Spring/summer	Spring/summer
Grazing/regrowth	Single	Single	Multi-graze
Days to grazing	60-90	90-120	42-70
Energy	***	**	***

STAR CHART KEY

–	*	**	***
None	Moderate	Good	Very good

Note: a difference of one * means that there is statistically significant difference.

Ultrastrike® pelleted turnip seed

WHAT IS IT?

Ultrastrike® pelleted turnip seed is a weight build-up seed coating allowing precision placement of turnip seed in modern precision drills.

It also contains a systemic insecticide and two contact fungicides to provide critical insect and disease protection during establishment. Ultrastrike® also contains the trace element molybdenum which is taken up during seedling establishment, enhancing growth.

WHY SOW PELLETED TURNIP SEED?

Precision planting ensures an even placement of seed allowing bulb yield to be maximised. A Pirongia, Waikato trial precision planted at 140,000 seeds per hectare demonstrated an average yield increase of 1,559 kgDM/ha (+15.4%) over conventional roller drilling at 3 kg/ha.

SOWING RATE

The recommended sowing rate is 140,000 seeds per hectare.
Seed is available in 1 hectare buckets.
Cleancrop™ bulb turnip will be available pelleted this spring.

Bulb Turnip
Cleancrop™ Brassica System

Barkant® TURNIP

performance bred®

Farm type	Days to grazing	Sowing rate
	60-90 days	1-3 kg/ha

NEW ZEALAND'S LEADING DAIRY TURNIP

Barkant® bulb turnip - the highest yielding summer bulb turnip in the business. You deserve the best turnip on the market and your stock deserve the best quality feed. Barkant® offers unbeatable proven performance year after year. Barkant® delivers supplementary protein as leaf and water soluble carbohydrates as bulb. The perfect balancer for summer pastures.

When you need summer feed, don't look past Barkant®

- Highest dry matter yields
- Outstanding energy, high protein bulb and leaf
- Tankard bulb shape to reduce risk of choke
- Early maturing for excellent summer feed

Barkant® case study

CRAIG GARLAND AND KELLY SHEELY

Summer production has been one of the added benefits of growing Barkant® turnips for Craig Garland and Kelly Sheely in the four seasons that they have been in the Waikite Valley.

This young energetic team are lower order sharemilking 530 cows on 150 effective hectares. In the past three seasons they have lifted production from 195,000 kgMS to currently 231,000 kgMS. The soil type is predominantly light pumice soils with some river silt and the farming system is mainly all ryegrass, with summer crops of turnip and PKE to balance feed deficits. There is 10 ha of Barkant® and 12 ha of Cleancrop™ turnip grown every year to support their summer dry period. They never deviate from this plan and they both work to each other's strengths. Craig takes care of paddock selection and preparation and Kelly is always feed budgeting and allocating.

Craig and Kelly are believers in best practice and do everything by the book. They have a lot of their own machinery so timing for them is imperative. Their paddocks are selected on poor ryegrass performance as their cropping policy involves a range of variables.

Seed bed preparation is key and they start with a good spray-out and apply fertiliser and lime according to their soil tests. Recently they have been adding 3 tonne of chicken manure to their crops and incorporating this into the seed bed. Traditionally they have used Cropzeal boron boost at 250 kg/ha with 2 tonne of lime where required. Following this they lead into full cultivation of discing and power harrowing. They drill Superstrike® treated Barkant® at 4 kg/ha. Rolling is an important part of their process and they have found over time that they have far better utilisation with the 4 kg sowing rate than any other. As their crops grow their second to third true-leaves they spray with broadleaf herbicides to control any weeds that may be present. Most years they have only required one spray of insecticide and following that apply Sustain at 250 kg/ha.

Kelly says, "this year more than others we really needed the summer crops due to weather inconsistencies. We traditionally start our Barkant® turnips on the 1st January with 10 hectares put aside for them. Our crop weights this year have been consistent with other years with 15 tDM/ha grown." Every year they start with a slow transition period and cows go on to crop after morning milking so they don't get any checks or their Fat Evaluation Index doesn't spike. "The key to achieving the results we get with our turnips is simple planning and having a realistic goal."

Green Globe TURNIP

Farm type	Days to grazing	Sowing rate
	90-120 days	0.8-2 kg/ha

THE MULTI-PURPOSE PERFORMER

Green Globe turnip – the reliable turnip that delivers good dry matter yields for your stock. It delivers flexible sowing options. Green Globe will perform in harsh winter conditions and lower fertility. When the going gets tough Green Globe performs for your stock.

Green Globe is the dependable turnip for tough conditions.

- Multi-purpose turnip can be sown for grazing in summer, autumn and winter
- Proven winter hardiness
- Good yield potential
- Late maturing

Pasja II FORAGE BRASSICA

performance bred®

Farm type	Days to grazing	Sowing rate
	42-70 days	4 kg/ha

THE FASTER BRASSICA FEED

Pasja II – the brassica to choose when fast, high quality summer/autumn feed is needed for your stock. Pasja II combines early maturity with yield and the option for multiple grazings, providing quality fast feed you can rely on.

Pasja II is the brassica you need for your stock when fast, quality feed is needed.

- High dry matter yields
- Excellent plant persistence
- Multi-graze option with excellent regrowth potential*
- Fast establishing
- Minimal ripening required

* Moisture dependant.

Chicory

WHAT IS IT?

Chicory is a perennial herb with a deep taproot and excellent animal performance potential. It produces a leafy, high quality feed over spring, summer and autumn when traditional pastures can decrease in quality. Chicory is a very versatile species and it can be sown as part of a permanent pasture mix, sown with clovers as a specialist lamb finishing crop or as a pure sward.

Advantages of Chicory

- Highly palatable
- Excellent feed for high liveweight gains
- Provides high quality feed through summer using summer rain, irrigation or stored soil water
- Able to produce high quality forage on acid soils
- Recovers quickly after grazing
- Does not cause bloat
- High mineral content, particularly zinc, potassium and copper
- Can be used for silage production as part of a pasture mix

Management Considerations for Chicory

- Best suited for rotational grazing
- Chicory does not fix nitrogen as it is not a legume therefore the crop requires high inputs of fertiliser for maximum growth potential
- Best suited to fertile soils
- Chemical control of some broadleaf weeds can be difficult e.g. thistles
- Chicory can be dormant in winter and grazing of companion species in winter must be done carefully so as to avoid damage to chicory's crown, especially when wet

PGG Wrightson Seeds offers Puna II (page 47) or a blend known as Rocket Fuel® (page 48) which contains Puna II and clovers to fuel your animal's performance.

GRASSLANDS **Puna II** CHICORY

performance bred®

NEW ZEALAND BRED

Farm type	Sowing rate	
	SPECIALIST	BLEND
	5-7 kg/ha	**0.5-2 kg/ha**

THE PALATABLE, PERSISTENT HERB

Puna II - the chicory to choose when high yielding, quality summer/autumn feed is needed for your stock. With semi-erect growth Puna II is easy for your stock to harvest meaning more meat, milk or wool for you.

Grasslands Puna II chicory is the palatable persistent perennial chicory for you.

- A true perennial chicory that lasts more than one year
- Thick, deep taproot giving drought tolerance
- Multi-graze option - recovering quickly after grazing
- Persistent
- Tolerant to *sclerotinia*
- Ready for grazing when plant has six true leaves

Rocket Fuel® CHICORY AND CLOVER MIX

Farm type	Sowing rate
	1 x bag/ha

FUEL YOUR FARM

Rocket Fuel – a customised versatile PGG Wrightson Seeds blend to fuel your animals. A combination of chicory, white and red clovers. A high proportion of clover will assist with the supply of nitrogen to the chicory which is essential, and provide a dense cover to discourage weeds, including volunteer grass. The red clover will also support the crop in drier areas or seasons as it is more resilient than white clover because of its taproot.

- Highly palatable
- Excellent feed for high liveweight gains
- Provides quality feed through summer
- High protein option for dairy farmers
- Recovers quickly after grazing

Puna II | Quartz MEDIUM LEAF WHITE CLOVER | Legacy LARGE LEAF WHITE CLOVER | Sensation*

= **13 kgs** (1 bag per hectare)

*While stocks last. Components of the mix may change subject to availability.

Brassica planning

PRE-SOWING

- Choose a paddock away from waterways for winter crops
- Leave an uncultivated buffer zone in hill paddocks (i.e. 3-15 metres, the steeper the hill the bigger the buffer zone) to trap/filter run off water
- Leave wet areas of the paddock e.g. temporary streams, swales uncultivated and fence off during grazing
- Cultivate along the contour i.e. not up and down to slow runoff
- Consider direct drilling
- Soil test to establish actual fertiliser requirements

GRAZING MANAGEMENT

- Feed the crop as long narrow breaks rather than wide breaks
- Reduce wastage by moving the fences once or twice daily rather than offering a few days at a time
- Where practical start grazing furthest from the waterway
- Fence off an area creating a lane to gateways
- Adjust feed intake to weather conditions e.g. if it is cold increase available feed
- Place supplements in winter brassica crops at the start of winter when soils are not too wet
- Graze sensitive zones e.g. wet areas when weather is settled and rainfall low
- Keep livestock out of waterways
- Provide transportable troughs for stock drinking water
- Back fence stock off land that has been grazed

CHECK WITH YOUR LOCAL REGIONAL COUNCIL FOR THEIR REQUIREMENTS WHEN FEEDING WINTER CROPS

Brassica planning

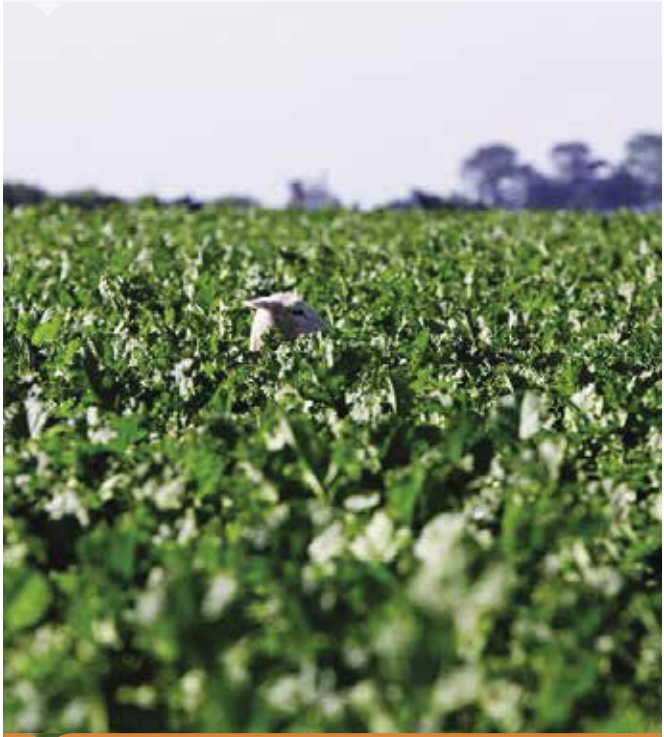
FEEDING BRASSICA CROPS

- Plan ahead with a feed budget. Measure per hectare crop yield (fresh weight x dry matter %). Match feed supply with daily animal demand. Allow for crop wastage during grazing
- Best practise is to obtain an actual dry matter percentage rather than a standard book value
- Test crop for nitrate content before grazing
- Don't allow stock sudden unrestricted access to a brassica crop
- Transition stock gradually from pasture to brassica. Allow for rumen adjustment time. Stock need a maximum of 3 weeks to transition fully to brassicas

Brassica planning

FEEDING BRASSICA CROPS

- Once transitioned, feed no more than 70-80% to dry stock or 33% for lactating dairy cows of diet as brassica. Feed extra fibre as pasture, hay, baleage or straw
- Stock must have access to water at all times
- Recognise potential for stock health problems on brassicas
- Discuss trace mineral requirements with your veterinarian. Animal demand for copper, selenium and/or iodine may increase when consuming brassicas



FOR MORE DETAIL HEAD TO:
www.pggwrightsonseeds.com or contact your local Area Sales Agronomist on 0800 805 505

Pests

Aphids:
Ultrastrike® brassica seed treatment will provide seedling protection. If identified in the crop, apply an insecticide

Leaf Miner:
Apply an appropriate insecticide when early damage is identified

White Butterfly:
Apply an appropriate insecticide when early damage is identified

Springtail:
Ultrastrike® brassica seed treatment will provide seedling protection. If identified in the crop, apply an insecticide

Greasy Cutworm:
Apply an appropriate insecticide as soon as damage is seen

Pests

Grass Grub:
Thorough cultivation in spring should reduce populations. If required apply a granular insecticide

Diamondback Moth:
Apply an appropriate insecticide when early damage is identified

Wheat Bug (*Nysius*):
Ultrastrike® brassica seed treatment will provide some seedling protection. Apply an appropriate insecticide before or after sowing to high risk paddocks

Slugs:
Always apply slug bait in direct drill situations

Argentine Stem Weevil:
Ultrastrike® brassica seed treatment will provide seedling protection. If identified in the crop, apply an insecticide

Diseases

Dry Rot:
Be mindful of crop rotation and minimise crop residue in second year crops

Leaf Spot:
Practice wide crop rotations to minimise infection from crop residues. Planting high quality certified seed.

Clubroot:
Be mindful of crop rotation with brassicas

Watery Soft Rot (*Sclerotinia*):
Practice clean crop rotations and minimise any residue from brassica crops

Alternaria:
Cultivation (ploughing) to minimise crop residuals for any second year crops.

Diseases

Black Rot:
Be mindful of crop rotation and bury previous crop debris

Ring Spot:
Clean crop rotations and placing crops away from paddocks where this disease has been identified in previous seasons

Wirestem/Damping off:
Ultrastrike® brassica seed treatment will provide seedling protection

Downy Mildew:
Plough cruciferous residue in completely and use long crop rotations. Utilisation of infected leaf tissue can reduce impact of infection

FOR MORE INFORMATION ON THE TREATMENT AND CONTROL OF BRASSICA DISEASES AND PESTS:

Contact your local seed retailer or call us on **0800 805 505**, or visit us online at **www.pggwrightsonseeds.com**, **www.seedtreatment.co.nz** or **www.agpest.co.nz**

Seed treatment

Establishment of Ultrastrike® treated swedes under springtail and aphid pressure.

The first four to six weeks after sowing is a critical stage in the life of a new plant as seedlings emerge and develop their plant structures. Sowing treated seed is a simple and cost effective means of helping to ensure a brassica crop establishes successfully and that it reaches its genetic potential in terms of yield and quality.

The Ultrastrike® and Superstrike® brassica seed treatments are insecticide and fungicide based products providing broad-spectrum protection against economically damaging insects and fungal diseases during the plant establishment period.

Both seed treatments also provide a supply of molybdenum trace element, which seedlings are able to take up during plant establishment.

The seed treatments are highly targeted and apply only very small quantities of chemical active ingredients to the soil, reducing the impact on the environment and the need to handle chemicals on farm.

Ultrastrike brassica. Superstrike brassica.

ULTRASTRIKE® AND SUPERSTRIKE® BRASSICA SEED TREATMENTS PROVIDE BROAD-SPECTRUM PROTECTION AGAINST KEY INSECTS AND DISEASES DURING PLANT ESTABLISHMENT.

Seed treatment

ULTRASTRIKE® AND SUPERSTRIKE® BRASSICA PRODUCT PROFILES

	Ultrastrike®	Superstrike®
Insect protection	Springtail	Springtail
	Aphids	
	Argentine Stem Weevil	
	Wheat Bug (*Nysius*)*	
Disease protection	*Fusarium*	*Fusarium*
	Pythium	*Pythium*
	Rhizoctonia solani	*Rhizoctonia solani*
Nutrients	Molybdenum	Molybdenum
Sowing rate	Same as per untreated seed	Same as per untreated seed
Recommended use	Winter crops	Summer crops
	Autumn sown crops	Winter crops, in areas where Springtail is the main insect threat during establishment
	Direct Drilled crops	

*In situations conducive to high *Nysius* pressure, where a brassica crop is sown next to a lucerne paddock or is established under hot, dry conditions, a foliar insecticide application may be necessary 2-3 weeks after sowing to enhance protection.

cleancrop® Brassica System

Seed Treatment

All Cleancrop™ Brassica System products include the Ultrastrike® brassica seed treatment, which provides this leading forage brassica technology with the most comprehensive seed protection in the market.

Visit www.seedtreatment.co.nz for more information on Ultrastrike® and Superstrike® seed treatments.

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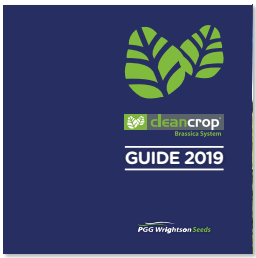
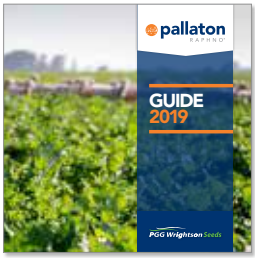
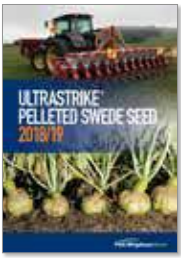
Other publications

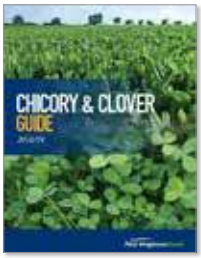
PGG Wrightson Seeds have developed a number of other publications to assist you on your farm.

The following publications are available:









To get a copy of one of these publications go to our website and download or email: **info@pggwrightsonseeds.co.nz** with your details.

For more information on brassica cultivars or the information contained within this brochure, contact your local seed retailer or

Freephone: 0800 805 505

www.pggwrightsonseeds.com

PGG Wrightson Seeds